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# AGRICULTURAL HISTORY



Volume 20

Number 3

July 1946

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Published Quarterly

by

THE AGRICULTURAL HISTORY SOCIETY

# AGRICULTURAL HISTORY

Published Quarterly by the Agricultural History Society

at Mt. Royal and Guilford Aves., Baltimore 2, Maryland

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*Agricultural History* is designed as a medium for the publication of research and documents pertaining to the history of agriculture in all its phases and as a clearing house for information of interest and value to workers in the field. Materials on the history of agriculture in all countries are included, and also materials on institutions, organizations, and sciences which have been factors in agricultural development. The Agricultural History Society assumes no responsibility for statements, whether of fact or of opinion, made by contributors.

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Correspondence concerning contributions, books for review, and back numbers may be sent to Everett E. Edwards, editor, Agricultural History Society, Room 3901, South Agriculture Building, Washington 25, D. C.; correspondence concerning membership dues and business matters to the secretary-treasurer, Charles A. Burmeister, at the same address.

Entered as second-class matter, October 12, 1928, at the post office at Baltimore, Maryland, under the Act of March 3, 1879.

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## THE UNITED STATES DEPARTMENT OF AGRICULTURE DURING THE COMMISSIONERSHIP

A STUDY IN POLITICS, ADMINISTRATION, AND TECHNOLOGY, 1862-1889

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"The future historian will commence a new chapter in American agriculture, eclipsing in interest those which have preceded it, with the establishment of a Department of Agriculture by an act of Congress. . . . The heart-wish of Washington, since echoed by almost every prominent cultivator of the soil, has thus, at last, been realized in the national government recognizing agriculture as entitled to its fostering care, and by its aid in applying the light of science to the guidance of rural labor. Agriculture, after having been kept waiting long, was elevated to its proper position in the political framework of our system of government during a period of civil strife."<sup>1</sup> Such was the appreciation and forecast of the popular Washington correspondent and enthusiast for the new agriculture, Ben: Perley Poore, in a 30-page survey of the history of American agriculture which he contributed to the report of the Commissioner of Agriculture for 1866. In the light of more than four score years of the growth of a department that has become "one of the largest agencies of government in the world" and by far the most influential one devoted to an occupational interest,<sup>2</sup> the statement appears highly restrained but at the time it seemed wishful and visionary.

To the casual observer the "organic act" of May 15, 1862 was no more than a gesture of good intent toward the supposedly still dominant interest. The relation to the struggle for the preservation of the Union was rather remote. Food and fiber, it was recognized, would help to

win the war, but, in accord with prevailing policies, the amount and variety of the supplies would be determined by individual self-interest and initiative rather than by governmental inducement and direction, except in furthering private enterprise as sought in the homestead measure approved five days later. The war for the Union gave the occasion and opportunity rather than the impulse for the new Federal agency. The determining influence came from the occupation itself, from its increasing needs and growing assertiveness. Humble and dubious as the new establishment appeared, its creation was basic in a continuous and fairly consistent national policy that reflected the successive stages of the American farming enterprise.<sup>3</sup>

From colonial times exploitive zeal was dictated both by public and private well-being. In a day of restricted governmental functions, encouragement to voluntary associations of producers was regarded as desirable. The proposal for a national board failed to arouse adequate interest, but within the States modest subsidies were granted to State and local societies.

More directly and pertinently the pragmatic physiocracy of the New World made liberal provision for the settlement, protection, and development of the frontier, the "natural" course which could not offend the most sensitive individualist. No policy had a wider and fuller appeal than the lavish bestowal of the available national heritage; the only issue was over the relative regional advantages. Whatever its limitations as a social safety valve, the public domain was assuredly an opiate for much political discontent—and thus a lifesaver to many a politician. Uncle Sam's broad acres afforded the tangible basis for sweeping, if

<sup>1</sup> U. S. Commissioner of Agriculture, *Report*, 1866, p. 527. Cf. the appreciation in the 1869 edition of R. L. Allen, *The American Farm Book*, 16 (New York, 1869).

<sup>2</sup> For thorough and understanding descriptions and analyses of the organization and functions of the present Department, see John M. Gaus and Leon O. Wolcott, *Public Administration and the United States Department of Agriculture* (Chicago, 1940); and Paul H. Appleby, *Big Democracy*, 11-27 (New York, 1945).

<sup>3</sup> Arthur P. Chew, *The Response of Government to Agriculture*, 1-6 (Washington, 1937); Asher Hobson, "The Evolution of Farm Relief," *American Scholar*, 11:495-501 (1942).

too often specious, solutions of individual and regional difficulties which would provide, supposedly, unlimited supplies of ham and eggs for the pre-emptor or squatter and start or stimulate at least extended public works for the community. Consonant with this attitude, the early scientific activities, both State and national, were directed to explorations, surveys, collections, and analyses which might extend and encourage the future utilization of the country's resources.<sup>4</sup>

Applied science brought increasing demand and rivalry for public aid. The "industrial revolution" was paralleled by the "agricultural transformation"; and in consequence the mercantilist vied with the physiocrat for recognition and benefits. Manufacturers and traders, being more compact groups and having more apparent and immediate necessities, steadily advanced their interests relative to that of the farmers. Agrarian agitations from the American Revolution to the Civil War were largely local and sporadic; by the fifties, however, there were increasing evidences of a group consciousness that sought justice from the "money power," parity of aid with industrialists, and equality of educational and social opportunity with the professional classes. The protest was delayed and diverted by the conflict of farmer and planter, but it persisted nonetheless. The growing and extending farm press furnished the organs of discussion and the societies and clubs the forums. Organization was extended from local and State realms to national. An attempt at such an organization in 1841 proved premature and ephemeral, but a decade later the distinguished and influential United States Agricultural Society was launched by devotees of the new agriculture representing all regions and all types of cultivation and husbandry. This society conducted fairs in different regions, held annual meetings at Washington which were addressed by leading national officials, and published a journal. In contrast to earlier organizations of gentlemen farmers, it had a distinct legislative program which had as its leading aims aid to agricultural colleges and the establish-

ment of an agricultural department with full executive status.<sup>5</sup>

The growing need for public activities in industrial realms brought a gradual increase of functions and of specialization of administration. As a means of promoting and protecting inventive genius under the constitutional authorization, the patent service was developed. In 1836 the Patent Office headed by a commissioner was established in the Department of State, and in 1849 it was transferred to the new "home" or interior department. The patent service attracted heads of ability and experience. Professional and business leaders like Henry L. Ellsworth, Thomas Ewbank,<sup>6</sup> Charles Mason,<sup>7</sup> Joseph Holt, William D. Bishop, and David P. Holloway were all of cabinet caliber.

Ellsworth, the first Commissioner, was a Connecticut Yankee of ingenuity and vision who was keenly interested in the mechanical and scientific aspects of the new agriculture. On his own initiative he collected foreign seeds and plants through the consular service and distributed them for trial. Congress though suspicious of such unauthorized services, in response to the Commissioner's enthusiastic representations in 1839, grudgingly provided \$1,000 for the collection and distribution of seeds and plants and the gathering and publishing of statistics. From this timid venture support and activities steadily grew.<sup>8</sup>

<sup>5</sup> Publications of the society: *Journal*, 1852-1857, *Transactions and Monthly Bulletin*, 1858, *Quarterly Journal of Agriculture*, 1859-1862; Ben: Perley Poore in U. S. Commissioner of Agriculture, *Report*, 1866, p. 525-526; Lyman Carrier, "The United States Agricultural Society, 1852-1860," *Agricultural History*, 11:278-288 (1937).

<sup>6</sup> For Ewbank's political philosophy, see Charles A. and Mary R. Beard, *The American Spirit*, 328-331 (New York, 1942).

<sup>7</sup> Mason's correspondence and journal for his Patent Office term constitute a large body of his papers which have been edited in typescript by Charles Mason Remey, *Life and Letters of Charles Mason, Chief Justice of Iowa, 1804-1882* (Washington, 1939).

<sup>8</sup> The agriculture work of the Patent Office may be best traced in the agricultural volumes of its reports, 1849-1861. Convenient summaries are James M. Swank, *The Department of Agriculture, Its History and Objects*, 7-23 (Washington, 1872); Alfred Charles True, *A History of Agricultural Experimentation and Research in the United States, 1607-1925*, p. 22-34 (U. S. Department of Agriculture, *Miscellaneous Publication 251*, Washington, 1937).

<sup>4</sup> Edward Salisbury Dana, and others, *A Century of Science in America*, 196-200, 398, 409-410 (New Haven, 1918); George P. Merrill, ed., *Contributions to a History of American State Geological and Natural History Surveys* (U. S. National Museum, *Bulletin 109*, Washington, 1920).



To administer the informally constituted agricultural work of the Patent Office and to carry on various lines of investigation, agricultural writers and specialists were employed. The directors and the more important assistants were Dr. Daniel Lee, agricultural editor and teacher, Professor Lewis C. Beck of the Rensselaer Polytechnic Institute, Frederick G. Skinner, son and associate of the pioneer farm journalist, Townend Glover, noted entomologist, Daniel J. Browne, naturalist, editor, and civil engineer, and Thomas G. Clemson, planter and mining engineer. This branch of the Patent Office, assigned to rooms in the basement, was referred to indefinitely as "bureau," "department," and "division"; the term that came to be used officially was "agricultural division of the patent office." The working head was designated at various periods as "clerk," "agriculturist," "director," and "superintendent." In 1860 the staff consisted of a superintendent, four clerks, including translators and special writers, the "curator" of the propagating garden, and various assistants. To 1855 the highest annual appropriation was \$10,000; from 1855 to 1861 the average was about \$54,000. Beginning in 1849 a separate volume of agricultural reports was issued.

The reports and correspondence indicate that the Patent Office was in touch with the leading writers and workers in agricultural improvement, as employees, correspondents, or contributors to the reports.<sup>9</sup> With the limitations of funds and the uncertainties of agricultural information, one must conclude that, in spite of the incompetence and possible venality of certain members of the staff, the efforts were in the main commendable. New ideas were brought together, experiences were exchanged, and an interest in the improvement of the occupation stimulated. At the least it was a beginning of Federal activity and led directly to a demand for something more adequate.

In spite of the services and possibilities of the inchoate division, there was a continuous denun-

ciation and ridicule of "patent office agriculture" from the farm press and other journals. The seed fund was held to be wasted, carelessly or dishonestly, the statistics, inadequate, much of the information, erroneous, and most of the officials, incompetent. Rivalries of seed dealers, farm papers, scientists, and regions were all involved in the controversy,<sup>10</sup> but the real basis of the attack was inadequacy in organization, funds, and authority. The demand for adequate establishment was a leading manifestation of the growing occupational consciousness.

For two decades there was a continuous agitation for a bureau or department. The leading agricultural papers gave the proposal strong support and the controversial James J. Mapes made it the main objective of his *Working Farmer*, started in 1849. The United States Agricultural Society was the center of agitation for a full department with a secretary in the cabinet. Charles B. Calvert of Maryland was the most persistent champion within the society. Leading State and regional societies gave their endorsement.<sup>11</sup>

Such persistent agitation from influential sources secured official recognition. The successive heads of the Patent Office desiring to be rid of a discrediting encumbrance favored a separate bureau. Responding to the growing demands of agricultural spokesmen, President Taylor recommended such a bureau in the new Department of the Interior, and the step was thrice urged upon Congress by his successor, President Fillmore.<sup>12</sup> In 1851, to

<sup>10</sup> Harry B. Weiss, *The Pioneer Century of American Entomology*, 212 (New Brunswick, N. J., 1936). For the attack on the division by Senator James M. Mason of Virginia, see *Congressional Globe*, 35 Congress, 2 Session, Feb. 1, 1859, p. 718-719.

<sup>11</sup> For typical statements, see New York State Agricultural Society, *Transactions*, 1848, p. 182-187; New Hampshire State Agricultural Society, *Transactions*, 1850, p. 48, 1855, p. 50; Tennessee State Agricultural Bureau, *Biennial Report*, 1855-56, p. 299-303; Pennsylvania State Agricultural Society, *Transactions*, 1855, p. 81; Ohio State Board of Agriculture, *Annual Report*, 1860, p. 450; *Working Farmer*, 1:33-34, 49, 72-73, 100-101, 119, 164-165 (1849), 4:124, 169 (1852), 8:25-26, 217 (1856); U. S. Agricultural Society, *Journal of Agriculture*, 8:34-37 (1860).

<sup>12</sup> Herbert Anthony Kellar, ed., *Salon Robinson, Pioneer and Agriculturist: Selected Writings*, 2:152, 155-157 (Indianapolis, 1936); *Rural New Yorker*, 14:197 (1863); James D. Richardson, compiler, *A Compilation of the Messages and Papers of the Presidents*, 5:18, 85-86, 128, 178 (Washington, 1897).

<sup>9</sup> Among the correspondents were Edmund Ruffin of Virginia, Charles B. Calvert of Maryland, Henry F. French of Massachusetts, Justin S. Morrill of Vermont, John Delafield and Benjamin F. Johnson of New York, Isaac Newton of Pennsylvania, and James W. Grimes of Iowa. See Letters Received by the Agricultural Division of the Patent Office, Records of the Office of the Secretary of Agriculture, in the National Archives. Writers like French, David A. Wells, and John Torrey contributed to the reports.

avoid possible constitutional objection, Commissioner Ewbank suggested that the bureau be made a branch of the Smithsonian Institution.<sup>13</sup> In 1860 Thomas G. Clemson, who had been appointed by the Secretary of the Interior to the newly designated position of "Superintendent of Agricultural Affairs of the United States" recommended an immediate increase of functions for the division, including the supervision of the public lands, and prepared a plan for a separate department.<sup>14</sup>

The times were clearly unfavorable for such an administrative departure. Like other proposals for extended Federal authority, this one encountered the traditional fears of centralized control—a perennial issue accentuated and exaggerated at this time by the sectional conflict involving an extreme assertion of State rights. Presidential recommendations were not heeded, and efforts at administrative expansion were discouraged. Commissioner Holt's innovation, in 1859, in sponsoring a gathering of representative farmers who formed an "Advisory Board of Agriculture of the Patent Office" met sharp criticism in Congress, accentuated by decreased appropriation.<sup>15</sup> The following year Clemson's elaborate departmental plan was not even made public. Bills for this purpose, introduced from time to time, did not get out of committee. So agricultural administration remained on an informal and uncertain basis until secession enabled a more compliant, if not particularly understanding, majority to make a start toward the desired establishment.

Like the proposal for aid to agricultural colleges, that for a department was given no recognition in party platforms or campaign discussions, but it was the first of the free-soil agricultural measures to be enacted and met no effective opposition. As was characteristic of the Lincoln administration in dealing with economic issues, the executive position was not decisive. The new Commissioner of Patents, David P. Holloway, a leading farm journalist and a former State legislator and member of Congress from Indiana, urged at length a department of industry with separate bureaus of agricul-

ture, manufacturing, and commerce.<sup>16</sup> Such an extension of functions would have been as premature as the assumed harmony of interests involved was unreal. In any case with curious lack of departmental teamwork, the Commissioner's plan was met by that of his chief, Secretary Caleb B. Smith, for a bureau in the Interior Department.<sup>17</sup> The Secretary's recommendation was repeated by the President with an observation that might have seemed ironical to those familiar with the long record of complaints and demands: "Agriculture, confessedly the largest interest of the nation, has not a department nor a bureau, but a clerkship only, assigned to it in the Government. While it is fortunate that this great interest is so independent in its nature as to not have demanded and extorted more from the Government, I respectfully ask Congress to consider whether something more can not be given voluntarily with general advantage. . . . While I make no suggestion as to details, I venture the opinion that an agricultural and statistical bureau might profitably be organized."<sup>18</sup> The report of the House committee and the bill of its chairman, Owen Lovejoy, followed this very moderate concession to the "largest interest."<sup>19</sup> Its leading spokesmen, however, were determined to have a status independent of any other department. Through the influence of the United States Agricultural Society, and especially of Calvert who was opportunely a member of the House at this time, the substitution of an independent department but without coordinate executive status was made.<sup>20</sup> In the Senate bureau organization was defeated by a tie vote. At the other extreme, Senator Joseph Wright of Indiana offered an amendment, which was overwhelmingly defeated, to establish four initial bureaus and to start the commissioner's salary at \$5,000.<sup>21</sup> The final bill, a compromise between the desires of the supporters of a full department and the expedient concessions of party regulars, met but 7 opposing votes from Eastern and Border States in the House and 13 from the East and

<sup>13</sup> U. S. Commissioner of Patents, *Report*, 1851, pt. 2, p. 653-656.

<sup>14</sup> *Ibid.*, 1860, p. 5-26; Alester G. Holmes and George R. Sherrill, *Thomas Green Clemson*, 20-21, 131-140 (Richmond, 1937).

<sup>15</sup> U. S. Commissioner of Patents, *Report*, 1858, pt. 2, p. iii-v, *Rural New Yorker*, 9:390 (1858); True, *A History of Agricultural Experimentation and Research*, 32.

<sup>16</sup> U. S. Commissioner of Patents, *Report*, 1861 p. 5-20.

<sup>17</sup> Secretary of the Interior, *Report*, 1861, p. 451-452.

<sup>18</sup> Richardson, *Messages and Papers*, 6:52-53.

<sup>19</sup> *Congressional Globe*, 37 Congress, 2 Session, Jan. 18, 1862, p. 218, Feb. 17, 1862, p. 855-856.

<sup>20</sup> True, *A History of Agricultural Experimentation and Research*, 40.

<sup>21</sup> *Congressional Globe*, 37 Congress, 2 Session, Apr. 22, 1862, p. 1755, May 8, 1862, p. 2017.

Middle West in the Senate.<sup>22</sup> Aside from the contention that independent status was inopportune and inappropriate—a position strengthened by executive attitude—the opposition warned of the dangers of Federal power and of centralized administration without being able to imagine the extent of future trends in that direction but with little enough point for the existing act.<sup>23</sup>

The new administrative venture was the first and longest continued trial of departmental organization without executive status.<sup>24</sup> The other interests so administered have been education (1867–1868) and labor (1888–1903). Such an anomalous makeshift in the Federal system was confusing to contemporaries and has remained so to later students of government.

The functions were essentially those of the Patent Office division, somewhat more elaborated and systematized. "The general designs and duties" were declared to be "to acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among the people new and valuable seeds and plants." The head was to collect and preserve valuable information from treatises, correspondence, experiments, and statistical compilations and to report on all these findings.

This executive head was a commissioner with a salary reduced by disparaging amendment to \$3,000 and with his main assistant a chief clerk. Upon congressional authorization he might employ "chemists, botanists, entomologists, and other persons skilled in the natural sciences pertaining to agriculture." In spite of restricted powers and inadequate salary, the position was sought from the first by or for men of national standing.<sup>25</sup> Such an attraction of the office was an evidence of the growing appreciation of agriculture as a profession and business and the consequent expectation of expanding functions. Pending such duties and responsibilities, the standing of the new department in professional and popular estimation

would depend largely upon the ability and initiative of the first commissioner. In view of the prevailing standards of the public service, the expectations of the new administrator were great indeed. The *American Agriculturist* demanded "an intelligent, capable, honest man, with special talents and qualifications for the post; one who can take in a broad view of the general agricultural and horticultural interests of the whole country."<sup>26</sup>

For the crucial initial selection, Lincoln had a wide choice, East and West, of leaders in the occupation of proven ability and with responsible endorsement. With such an opportunity and with no established precedents, an appreciation of the trend of the center of agricultural production as well as a recognition of the key political position of the farmer in that region in the President's party would have determined a Middle Westerner of assured standing in regional and national occupational circles as well as in public affairs. Instead, by one of those quixotic personal preferences to which he was addicted at times and to a lack of appreciation of the great potential interests involved, the Prairie President made a selection that was unfortunate alike for the occupation, the government service, and the party.

Isaac Newton, who was in charge of the agricultural division when appointed to head the new department, was a dairy farmer of southern Pennsylvania. By the best established methods and careful management, he had built up a "model farm" which he integrated with a pioneer dairy lunch in Philadelphia and a butter trade to special customers, including the White House in Washington. He thus made personal contacts in high official places, which he was never slow to utilize. Newton had been active in the Pennsylvania and United States agricultural societies and a correspondent of the Patent Office division, and he was said to have urged the department project on successive administrations from that of President Taylor. With real business acumen, which failed him only in an ill-advised speculation in a Virginia plantation, and ability to make influential friendships, he had limitations and personal qualities that definitely unfitted him to give dignity and effective recognition to the pioneer venture in economic administration and policy direction.<sup>27</sup>

<sup>26</sup> *American Agriculturist*, 21:68 (1862). Cf. *Rural New Yorker*, 13:238 (1862).

<sup>27</sup> The family and official appreciations, at points revealing beyond intent, are the sketch by his granddaughter, Amanda Almira Newton, "Isaac Newton,

<sup>22</sup> *Ibid.*, Feb. 17, 1862, p. 857, May 8, 1862, p. 2017.

<sup>23</sup> *Ibid.*, Apr. 22, 1862, p. 1756, May 8, 1862, p. 2014–2015.

<sup>24</sup> *U. S. Statutes at Large*, 12:387–388.

<sup>25</sup> Among those prominently mentioned were Jonathan B. Turner and John A. Kendicott of Illinois, John H. Klippart of Ohio, Benjamin P. Johnson of New York, Charles M. Wetherill of Pennsylvania, and Nathaniel P. Banks of Massachusetts.



With limited education and very moderate natural ability, his personal success in a limited range of undertakings had given him the "practical" self-made man's assurance of a grasp of the essential principles and practices of scientific farming and thus made him unappreciative of the difficulties and requirements of the scientific specialists. Almost equally detrimental to the effective supervision of his own department was his insatiable zeal for gossip and scheming regarding the appointments and policies of the whole administration, civil and military.<sup>28</sup>

With few exceptions the garrulous and self-assured Commissioner did not have the trust and respect of the farm press, societies, and other leaders of the profession. There was a continuous demand for his replacement by a more efficient and representative leader of the interests of the farmer and the planter.<sup>29</sup> Newton's close friendship with President and Mrs. Lincoln for whom he had rendered many special services was proof against all attacks.<sup>30</sup> In his last annual message in December 1864, Lincoln expressed full confidence and satisfaction in the Department and its head. "The Agricultural Department, under the supervision of its present energetic and faithful head, is rapidly commending itself to the great and vital interest it was created to advance. It is

peculiarly the people's Department, in which they feel more directly concerned than in any other. I commend it to the continued attention and fostering care of Congress."<sup>31</sup> In April 1867, President Johnson, at last responding to the pressure for change, nominated Joseph C. G. Kennedy, former director of the census and prominent in the United States Agricultural Society. The nomination was rejected for political reasons, and no further action was taken before Newton's death in June.<sup>32</sup> The chief clerk, John W. Stokes, according to legal provision, served as acting commissioner until a regular head was selected from a large and widely distributed group of aspirants.

After two years of continuous agitation for a change, there were reported to be about thirty active candidates for the position, with varying degrees of competency and availability.<sup>33</sup> Both tests seemed to be best met by General Horace Capron, a native of New England, educated in New York, a successful farmer and manufacturer in Maryland, and, after creditable service as a Union officer, a noted stock breeder of Illinois.<sup>34</sup> With the conflicting interest between the President and the Congress, the combination of Middle Western and conservative Border State support made the country's most famous breeder of Devon cattle a generally acceptable compromise.<sup>35</sup> Capron justified his appointment by maintaining the confidence of the constituency and the support of the administration so fully that there was no serious intent of a change until he resigned in 1871 to head a notable agricultural advisory commission for Japan.<sup>36</sup>

First Commissioner of Agriculture," typed manuscript in U. S. Department of Agriculture Library; and the obituary sketch by his nephew and temporary successor, John W. Stokes, in the *Monthly Report of the Agricultural Department*, May-June 1867. For additional details of his personal career, see the *Rural New Yorker*, 13:238 (1862), quoting the *New York Argus*.

<sup>28</sup> Newton's ideas may best be judged from his annual reports. On his political gossiping and scheming, see Howard K. Beale, ed., *The Diary of Edward Bates, 1859-1866*, 222 n., 227, 228, 234, 236, 267, 268, 279, 290-291, 293, 423-429 (Washington, 1933); Theodore C. Pease and James G. Randall, eds., *The Diary of Orville Hickman Browning*, 1:591-592 (Springfield, Ill., 1925).

<sup>29</sup> Eastern papers were generally hostile from the start, Western and Southern more appreciative. For representative citations, see Earle D. Ross, "Lincoln and Agriculture," *Agricultural History*, 3:60-61 (1929). The *Cultivator and Country Gentleman*, 28:209 (1866) declared: "Every leading Agricultural and Horticultural Society in the country has publicly urged the removal of the Commissioner, a unanimity of sentiment which we have never before known to be shown in such a way."

<sup>30</sup> *The Diary of Orville Hickman Browning*, 1:608-609; Carl Sandburg and Paul M. Angle, *Mary Lincoln, Wife and Widow*, 103, 232, 255, 268 (New York, 1932).

<sup>31</sup> Richardson, *Messages and Papers*, 6:251.

<sup>32</sup> *Cultivator and Country Gentleman*, 29:225, 241 (1867).

<sup>33</sup> Among those most actively supported were Dr. Norton S. Townshend of Ohio, John P. Reynolds and Willard C. Flagg of Illinois, Frederick L. Olmsted of New York, and Donald G. Mitchell of Connecticut. *Prairie Farmer* (n.s.), 17:40 (1866), 20:322 (1867); Ohio State Board of Agriculture, *Annual Report*, 1866, p. 17; *Cultivator and Country Gentleman*, 29:241, 256, 273, (1867); Waldo H. Dunn, *Life of Donald G. Mitchell*, 312 (New York, 1922).

<sup>34</sup> Horace Capron, *Memoirs*, typed copy of original manuscript in U. S. Department of Agriculture Library; Kellar, *Solon Robinson*, 2:245-246, 449; *Cultivator and Country Gentleman*, 30:397 (1867); *Rural New Yorker*, 21:153-154 (1870).

<sup>35</sup> Capron, *Memoirs*, 1:141-142.

<sup>36</sup> *Ibid.*, 154-175, and v. 2, *passim*; U. S. Commissioner of Agriculture, *Report*, 1783, p. 364-374.

To fill the vacancy the selection of the venerable Frederick Watts of Pennsylvania, jurist, railroad president, farmer, and promoter of his State's agricultural college, had obvious elements of justification on the basis of the candidate's experience and public record,<sup>37</sup> but it was really a matter of State patronage. The position had first been offered to an agricultural journalist of Philadelphia.<sup>38</sup> The appointment was made without consultation with agricultural leaders who, in fact, in this period were not easy to contact through representative spokesmen, and objections arose at once on the grounds of age and region. His subsequent efforts to gain the support of influential groups were not very skillful, and it was felt that he lacked an understanding and failed to provide an effective direction of the policies of the Department. He became involved in controversies with prominent scientists and with departmental workers over the nature and conduct of research and the allocation of funds. His pretentious observations on technical subjects brought ridicule and general discredit to his administration.<sup>39</sup> There were concerted efforts to secure a more positive and energetic representative in this era of agrarian agitation. In 1875 John W. Hoyt, editor of the *Wisconsin Farmer* and one of the most consistent supporters of the Department and of the agricultural colleges, claimed that the position had been definitely promised to him the previous year and that he had been making preparations to conduct it in a thorough manner.<sup>40</sup> Regardless of the pressure for new and more virile blood, President Grant who typically supported loyal appointees, allowed the rather fussy old gentleman to carry on in his deliberate way until the end of the term.

President Hayes supplied an abundance of western virility in the person of General William G. Le Duc, an aggressive Buckeye transferred to the Minnesota frontier where he had been a salesman,

lawyer, and land promoter.<sup>41</sup> The appointment was said to be a personal one due to intimate army relations, but the usual party appeal and pressure was brought to bear rather more systematically than usual.<sup>42</sup> Le Duc had a bluntness and forthrightness in making appointments and removals, initiating policies, and dealing with organized groups that pleased many and offended some. It could not be said of him as of his predecessor that he was vacillating in making decisions and left the supervision of the staff to his clerk. With all his prejudices and overenthusiasms, he did much to bring the service both to public and congressional attention and gained a reputation as an administrator that led to a considerable effort to secure his retention by the succeeding administration.<sup>43</sup>

In the Garfield administration at the height of the spoils system, the aim was to reconcile party standing and support with the desires of regions and of special interest groups. Such considerations brought to the head of the agricultural service in 1881 Dr. George B. Loring of Massachusetts, a rather pompous physician, devotee and patron of the new agriculture, and politician, who was completing his second term in Congress as a lame duck.<sup>44</sup> Loring had had an eye on the developing office for a decade at least. In December 1872, one of his friends had written to Senator Justin S. Morrill suggesting that the land office and the supervision of the land-grant colleges be given to the agricultural department, and then it would have sufficient functions and dignity to justify Loring's conducting it. The next month the doctor offered the modest proposal that he be

<sup>41</sup> William G. Le Duc, *Recollections of a Quartermaster*; Autobiography of General William G. Le Duc (1890), typed copy in U. S. Department of Agriculture Library of original manuscript in the possession of his brother, Henry M. Le Duc; Le Duc Papers, Minnesota Historical Society.

<sup>42</sup> Printed pamphlet of letters of endorsement in Le Duc Papers; *Cultivator and Country Gentleman*, 42:432 (1877); Gideon S. Ives, "William Gates Le Duc," *Minnesota History Bulletin*, 3:63 (1919).

<sup>43</sup> Pamphlet of letters of endorsement (1877-1881) in Le Duc Papers; St. Paul *Pioneer Press*, Mar. 17, 1877, quoting *Hastings Gazette* (Minn.); *Hastings Gazette*, Apr. 16, 1881.

<sup>44</sup> *Rural New Yorker*, 40:401, 408 (1881); Ralph H. Gabriel's sketch in the *Dictionary of American Biography*, 11:417-418 (New York, 1933), is revealingly frank.

<sup>37</sup> Thomas I. Mairs, *Some Pennsylvania Pioneers in Agricultural Science*, 170-178 (State College, 1928).

<sup>38</sup> *Cultivator and Country Gentleman*, 36: 440 (1871).

<sup>39</sup> *American Agriculturist*, 31:49, 130 (1872), 35:330-331 (1876); *Rural New Yorker*, 26:400 (1872); C. C. Parry to George Engelmann, Mar. 12, 1876, Parry Papers, Iowa State College Library.

<sup>40</sup> Hoyt to Morrill, Oct. 15, 1875, Morrill Papers, Library of Congress. For suggestions of other candidates, see George B. Loring to Morrill, Jan. 4, 1873, June 18, 1875. *Ibid.*



appointed Secretary of the Interior to serve until the suggested transfer of powers to the agricultural department was made, whereupon he would assume the direction of the latter department.<sup>45</sup> Without this free and easy adjustment that assumed full executive and legislative complacency, Loring accepted the Department as it was by the eighties and directed it in new developments that helped to bring it to full executive status by the end of the decade.

President Cleveland's selection for an office of rapidly growing powers and prestige verified his sententious assertion that the best service to the party was that to the country. The appointment of Norman J. Colman, who started his career in New York and served long in Missouri as lawyer, agricultural journalist, legislator, and educational leader, was received with unusual favor. Fellow editors were gratified to have a member of their profession chosen for the strategic post, and Colman had a better press than any of his predecessors. In the unusually dynamic years that marked the culmination of one stage of agrarian agitation and the inauguration of more systematic regulatory and research functions with increasing personnel and new professional contacts, he conducted the Department with a skill, tact, and efficiency that facilitated the transition to the cabinet status. His brief tenure as the first secretary was an inadequate recognition of his contribution to the government service and to the occupation.<sup>46</sup>

Regional consciousness became an increasing influence in appointments. The six commissioners were divided equally between the East and the Middle West, but the latter region soon came to feel that, regardless of party control, the spokesman of the agricultural interest should be a representative leader from its dominant belt of production. From the first the Corn Belt States had their favorite sons, sometimes in embarrassing numbers. There was deep resentment in the region at Grant's failure to appoint another westerner after Capron's resignation, and Le Duc's selection was felt to be a recognition of the center of the interest involved. "Father" Clarkson, the assertive agricultural editor of the *Iowa State Register*, welcomed the appointment as that of

"a man identified with the interests of the Northwest which is hereafter to be the United States, all other portions sooner or later assuming the relation of outlying territories. . . . The Northwest agricultural interests have reason to be grateful to the President for this appointment, in preference to some of the learned men of the east, who neither know nor appreciate us."<sup>47</sup> The plain-spoken old journalist was especially contemptuous of the aspirations of metropolitan "side-walk editors" to the headship of a farmers' department.<sup>48</sup>

At the same time there was a desire for occupational recognition and advancement that cut across both regional and, to some extent, party lines. The West was generally reconciled to the appointment of Loring—the last of the Eastern selections—by the hope that his prominence in politics and in agricultural activities might hasten the attainment of cabinet status.<sup>49</sup>

Whatever the influences in selection after the first unadaptable incumbent, the commissioners were men of ability and recognized attainment. All were well trained; they were college graduates except Capron who had made academic preparation for West Point three had legal and one medical training. All five had had conspicuous civil or military service and had been active in agricultural organizations. The refusal of incoming presidents, with the exception of Grant in the case of Capron, to continue the existing head indicated the recognition of the importance of the position. Administratively there was sound justification for each new administration making its own selection of an officer who was increasingly a policy determiner and the director of a staff that had grown to between four and five hundred by the end of the period. The opinion of leading agricultural educators like Evan Pugh, Samuel W.

<sup>47</sup> *Iowa Weekly State Register*, July 20, Aug. 24, 1877. This editor had previously endorsed James Wilson for the commissionership, just 20 years before he became secretary. *Ibid.*, Apr. 6, 1877.

<sup>48</sup> *Ibid.*, Mar. 30, 1877.

<sup>49</sup> *Ibid.*, Mar. 11, Apr. 1, May 27, 1881. Clarkson was fearful that Colman from his location might favor the Texas cattle interests at the expense of those of the Northwest, and he hoped that the new head would be chosen either from Iowa or Illinois. *Ibid.*, Dec. 19, 1884. According to his biographer, Clarkson himself was offered the position by both Grant and Garfield, but no reference has been found to the offers in contemporary discussion. Cyrenus Cole, "Father" Clarkson," *Midland Monthly*, 1:70 (1894).

<sup>45</sup> Daniel Needham to Morrill, Dec. 31, 1872, Loring to Morrill, Jan. 4, 1873, Morrill Papers.

<sup>46</sup> Floyd G. Summers, "Norman J. Colman, First Secretary of Agriculture," *Missouri Historical Review*, 19:404-408 (1925); *American Agriculturist*, 44:217 (1885); *Rural New Yorker*, 48:230 (1889).

Johnson, and Eugene W. Hilgard that the commissioner should be a technically trained expert showed a lack of understanding of the true position of the Department and was contrary to what was to be the best administrative practice in the regular executive departments.<sup>50</sup> For carrying on the routine and technical activities under the direction of a confessedly political head, a permanent service of the best trained workers in the various divisions was essential.

Unfortunately in these formative years there was no real service; political traditions, professional standards, and systems of training were all against it. In 1864 Donald G. Mitchell suggested that the new department should have several Arthur Youngs on its staff.<sup>51</sup> Obviously if such men had been available, the scale of compensation and the conditions of selection and tenure were not suited to attract them to public employment. Before the introduction of classified service, the department that was to have the largest proportion of classified employees was regarded as just another refuge for place hunters.<sup>52</sup> Persons who had rendered service to the agriculture of their State thought employment in the Federal Department a merited reward. Oliver H. Kelley felt that after all he had done to boost Minnesota its congressional delegation should provide him with employment in which he could make a comfortable living and pay a hired man back home.<sup>53</sup> William Duane Wilson of Iowa,

after having his embryo State bureau abolished, likewise found temporary employment in the Federal Department. The secretaries of the agricultural societies of various States were given positions or special research assignments. A host of other applicants could offer no plea but party loyalty and the backing of a congressman or party leader. The demands were far in excess of available positions and funds, and not a few useless or incompetent hangers-on cumbered the pay rolls. Several incoming heads gained serious ill-will at the start by instituting a reduction of needless employees without being able to establish a service consciousness, loyalty, and ambition.<sup>54</sup>

In a study of the objectives of the Department, this period as regards "personnel outlook" has been classified as "individual."<sup>55</sup> Unity of purpose and proper coordination and subordination were lacking, and allocation of powers and lines of demarcation were not clearly defined. A departmental esprit de corps was wholly lacking, and internal dissension was inevitable. Commissioner Le Duc charged openly that the veteran statistician, Jacob R. Dodge, was deliberately conspiring to undermine him by criticism and ridicule to Dodge's friends and relatives in the Department and to hostile papers and that Dodge was supplying advance information to Wall Street. In view of the previous and later record of this industrious employee, his denial of the charges should be given

<sup>50</sup> Elizabeth A. Osborne, ed., *From the Letter-Files of S. W. Johnson*, 114, 144 (New Haven, 1913); Eugene W. Hilgard, "Progress in Agriculture by Education and Government Aid," *Atlantic Monthly*, 49:654-661 (1882). Hilgard maintained that an executive department was not desirable, that policy determination should come from Congress in which agriculture should be effectively represented, and that the Department should be devoted to expert and technical administrative functions. *Ibid.*, 656-657. The *Rural New Yorker*, 47:800 (Dec. 1, 1888), felt that the new commissioner or secretary should be a leader who "by education, experience, and integrity" could best serve "the country's agricultural needs" regardless of party.

<sup>51</sup> *Wet Days at Edgewood*, 254 (New York, 1864).

<sup>52</sup> L. O. Howard, *A History of Applied Entomology*, 88 (Smithsonian Institution, *Miscellaneous Collections*, v. 84, Washington, 1930).

<sup>53</sup> Kelley to Ignatius Donnelly, Feb. 5, 1867, Donnelly Papers, Minnesota Historical Society. At this time Kelley was seeking to be transferred from the Department of Agriculture to the position of a "special agent at large" in the postal service. The previous

year Kelley had suggested that he and Donnelly call on President Johnson in behalf of Kennedy. "If through any influence of yours he should be appointed, it would be a good thing for both of us." Kelley to Donnelly, Dec. 27, 1866. *Ibid.* On Kelley's relations with the Department of Agriculture, see also his *Origins and Progress of the Patrons of Husbandry*, 11-13 (Philadelphia, 1875). He wrote on Minnesota resources and agriculture for the Patent Office and Department reports.

<sup>54</sup> Capron, *Memoirs*, 1:143-147; U. S. Commissioner of Agriculture, *Report*, 1867, p. 17, Le Duc, *Recollections*, 156-159; Le Duc's Office Journal is full of interviews with applicants or their relatives and friends. Le Duc Papers. Letters of Colman indicate the constant pressure he was under to retain or add place holders. See letters to "My dear Will," Aug. 18, 1887, C. H. Jones, Sept. 26, 1888, and N. S. Gay, Jan. 25, 1889, in Records of the Office of the Secretary of Agriculture, Press Copies of "Domestic" Letters Sent by the Commissioners of Agriculture, 109:18-19, 110:388, in the National Archives.

<sup>55</sup> Gaus and Wolcott, *Public Administration and the United States Department of Agriculture*, 9 n.

large credence, but the misunderstanding led to his temporary service in the census bureau.<sup>56</sup> Charles V. Riley, the ambitious entomologist under Le Duc, sought the establishment of a special commission and increased appropriations for his division directly through his friends in Congress without consulting his chief. This again led to a temporary withdrawal with a break in the continuity of projects.<sup>57</sup>

The chief clerk, whose position corresponded in a general way to that of an assistant secretary under executive status, was in a number of cases a disturbing and divisive influence. With general administrative rather than technical duties and with rank next to that of the commissioner, he was at times an interfering and hampering influence. Newton's removal of capable clerks to make a place for his nephew at two different times brought discredit to the Department from the outside and unrest within.<sup>58</sup> Watt's clerk, James M. Swank, a well-known journalist and special writer, was charged with not only controlling the routine work but determining policies of the divisions, including appointments and removals. Again uncertainty of divisional functions and jurisdiction and of the relations of each particular division to the whole service made possible such personal interference by a subordinate.<sup>59</sup>

Political pull, personal contentions, and insecurity of tenure involved the scientists who in spite of low salaries and unfavorable conditions of work in a period of limited opportunities for employment were drawn to the Department. While serving in the Patent Office, Townend Glover, the entomologist, took umbrage at his chief's editorial supervision and after resigning vented his spite in verbal and pictorial caricatures.<sup>60</sup> Later in 1872,

James M. Swank, the chief clerk, in a historical sketch of the Department, took occasion to call attention to neglected areas in the work of the entomology division which brought a pamphlet of defense from the offended scientist.<sup>61</sup> Newton early in his term alienated the scientific fraternity by the removal of his distinguished chemist, Dr. Charles M. Wetherill, on the charge that he was giving too much attention to chemical work in other departments.<sup>62</sup> In 1869 Dr. John Torrey secured the appointment of his protégé, Dr. Charles C. Parry, as botanist to the Department with the main purpose of getting the accumulated collection from plant explorations, deposited at the Smithsonian Institution and classified for a national herbarium.<sup>63</sup> Capron was agreeable to such a specialized range of work, but Watts felt that "the exclusive care of a collection of dried plants" was not "appropriate to the mission of the botanist of a Department organized to minister to the practical work of farmers" and forced Parry's retirement.<sup>64</sup> Torrey and Parry heatedly claimed that the Commissioner had flagrantly violated professional ethics and was a party to political intrigue; they threatened to remove the specimens from the Department as well as, if necessary, the offending head himself.<sup>65</sup> Other prominent scientists, including Asa Gray, took up their pens in defense of their fellow worker. The correspondence with the Commissioner and elaborate memorials on his incompetence and low standards were printed in leading scientific journals,<sup>66</sup> but all of the well-phrased satire and reprobation was wasted on official Washington. The new botanist carried on in accord with his chief's understanding of practical service to the farmers. The entomologist, Charles V. Riley, who went out under Le Duc was able to force himself back with

<sup>56</sup> Le Duc's Office Journal, Jan. 31, 1878, p. 90-106; True, *A History of Agricultural Experimentation and Research*, 45, 54, 183.

<sup>57</sup> Howard, *A History of Applied Entomology*, 86.

<sup>58</sup> *American Agriculturist*, 24:303 (1865); *Prairie Farmer*, 15:396 (1867).

<sup>59</sup> J. H. Beckwith, "My Experiences in the Department of Agriculture," July 1872, by a former filing clerk, in Morrill Papers; *American Agriculturist*, 31:209-210 (1872); Andrew Denny Rodgers, *John Torrey, A Story of North American Botany*, 293-294 (Princeton, 1942).

<sup>60</sup> Charles Richards Dodge, *The Life and Entomological Work of the Late Townend Glover*, 13-19 (U. S. Department of Agriculture, Division of Entomology, *Bulletin 18*, Washington, 1888).

<sup>61</sup> Swank, *The Department of Agriculture*, 60; Weiss, *The Pioneer Century of American Entomology*, 207.

<sup>62</sup> Edgar Fahs Smith, "Charles Mayer Wetherill, 1825-1871," *Journal of Chemical Education*, 6: 1476-1477, 1670-1680 (1929).

<sup>63</sup> Parry to Engelmann, Nov. 16, 1868, Apr. 1, 1869; Torrey to Parry, Mar. 18, Apr. 20, May 17, June 10, 16, Dec. 16, 1869, Jan. 8, Mar. 4, 1870, May 6, 1871, Parry Papers; Rodgers, *John Torrey*, 293.

<sup>64</sup> Swank, *The Department of Agriculture*, 57.

<sup>65</sup> Parry to Engelmann, July 8, Sept. 27, Oct. 12, 1871, Parry Papers; Rodgers, *John Torrey*, 293-294.

<sup>66</sup> *American Naturalist*, 6:39-45 (1872); *American Journal of Science and Arts* (ser. 3), 3:315-318 (1872).



his group under Loring and the ad interim appointee, Professor John H. Comstock, returned to Cornell University.<sup>67</sup> Dr. Peter Collier, the distinguished chemist, was one of the most provocative as well as promotive of division heads. His sugar investigations found favor with Le Duc, but when they came to absorb the main effort of his division in the eighties Loring replaced him with the hardly less provocative Harvey W. Wiley.<sup>68</sup>

In these fairly typical cases of scientist and technician versus administrator, the scientist side was the only one presented. There was usually something, at least, to be said for the administrator. The specialists were not always adapted to the needs of the service and at times did not seriously endeavor to make the necessary adjustments. Some of them were impatient with the delays and interruptions to their special projects. Some, inside and outside the Department, were openly contemptuous of practical and popular devices and procedures that seemed necessary to win public favor.<sup>69</sup> The commissioners were the victims of the political system and under constant pressure to make large showings with small funds. They naturally desired each line of work to be developed as usefully as possible and sought, within the limiting conditions of selection, the men who could show results. In each of the cases cited, the removed officials were replaced by competent and usually more adaptable workers. The whole personnel system was unsound, but it was generally accepted as a matter of course, except by a small group of reformers who were just beginning to institute a new system. The scientists themselves, it must be noted, had no aversion to the system when it worked to their advantage, namely when they could apply their own political influence and pressure.<sup>70</sup>

In spite of the generally unsatisfactory conditions of appointment and tenure, there were notable cases of long connection that marked the beginnings of a career service. Townend Glover, Jacob R. Dodge, and William Saunders served in the Department until they retired; the first two began their service in the Patent Office division. Leland O. Howard, entomologist, Daniel E. Salmon, veterinarian, Harvey W. Wiley, chemist, and Beverly T. Galloway, botanist, all began their long and notable careers in the Department during the commissionership stage. Many others, after serving creditably for a series of years and in some cases for more than a decade, voluntarily transferred to other fields of work, in most cases retaining professional contacts with the Department. It was indicative of a growing occupational service consciousness that, following the defeat of his party, there were serious suggestions that Colman's services merited his being retained as assistant secretary.<sup>71</sup>

Outside relations were of prime importance for the growth and service of the Department. Dealings with State boards were complicated and prejudiced by duplication and rivalry of efforts and the fear of Federal control and direction. This threat of national regimentation was voiced by Senator James W. Grimes of Iowa in 1866 during an early investigation of the Department's activities. A national department, he held, was "altogether too great a thing to be run by a central government here at Washington. . . . We must have these organizations in each State. The idea of one man here at Washington undertaking to tell the people of this country, extending as it does through so many parallels of latitude and longitude, what may be the particular fruits or cereals adapted to a particular kind of soil or climate, is a great hum-

chemist, Morrill Papers; Parry to Engelmann, Oct. 12, 1871, on threat of political pressure, Parry Papers; *American Agriculturist*, 24:311 (1865), appointment on foreign mission of an agricultural scientist alleged to be a rival for the commissionership.

<sup>71</sup> *American Agriculturist*, 48:86, 162 (1889). For Colman's own desire for a merit service free from political control, see his letters to H. P. Armsby, May 2, 1887, and to W. O. Atwater, Dec. 2, 1887, in Records of the Office of the Secretary of Agriculture, Press Copies of "Domestic" Letters Sent by the Commissioners of Agriculture, 100:317-318, 104:79, in the National Archives; U. S. Commissioner of Agriculture, *Report*, 1888, p. 9.

<sup>67</sup> Howard, *A History of Applied Entomology*, 89.

<sup>68</sup> Le Duc, *Recollections*, 164-166; Harvey W. Wiley, *An Autobiography*, 152-155, 159, 163-165 (Indianapolis, 1930). For Collier's previous academic difficulties, see Collier to Morrill, Dec. 31, 1876, Oct. 18, 1877, Morrill Papers.

<sup>69</sup> Howard, *A History of Applied Entomology*, 86; Osborne, *From the Letter-Files of S. W. Johnson*, 225, 236-237.

<sup>70</sup> Evan Pugh to S. W. Johnson, Dec. 8, 1863, regarding candidate for chemist, copy in Alfred C. True Papers, U. S. Department of Agriculture; Secretary Schurz to Morrill, July 16, 1877, again appointment of

bug."<sup>72</sup> The establishment of Federal-supported experiment stations was to be delayed by the fear of subjection to the authority of the Commissioner at Washington.<sup>73</sup> Both sides complained of lack of cooperation in the collection of statistics and in other matters of mutual concern.<sup>74</sup>

"Cooperation between the department and the land-grant colleges," declared an official bulletin in 1930, "was provided for in the Morrill Act," also passed in 1862.<sup>75</sup> This curious anachronism anticipates the adjustment of over a quarter of a century, effected not so much by legal requirement as by gradual recognition of mutuality of aims and functions. Deliberate attempts were made by the first commissioners to gain the good will and cooperation of the college administrators and staffs, but not until the new responsibilities and demands came to both agencies in the later eighties were the efforts attended by marked success. The early reports gave much appreciative attention to the beginnings of the various colleges; conventions were called at the Department in which the college representatives were given conspicuous place and attention, and research publications were sought for the departmental bulletins. Unhappily these logical and wholly desirable interrelations at times occasioned more disagreement than common effort and understanding.<sup>76</sup> On the one side was sus-

picion of political motive and impatient and censorious criticism of methods and standards, and on the other a predilection for immediate and "practical" results and a lack of appreciation of professional standards and academic sensibilities. Both failed to distinguish the peculiar functions of the "political officer," the administrator, and the technician—distinctions that were to be learned slowly and in a hard and costly way.<sup>77</sup>

With farmers' organizations there was generally a better understanding; commissioners and grangers spoke the same language and had much the same point of view and aims. The Grange was a sort of stepchild of the Department; some of the organizers were on the staff and William Saunders was the first master.<sup>78</sup> The Alliances favored the Department's plans and efforts to do things in a direct and practical way, in contrast to the seemingly slow and uncertain processes of research and experimentation. Failing to get the support and appreciation of the State boards and the colleges, Le Duc came largely to disregard both and assiduously and effectively cultivated organized groups of producers whom he met at State and regional expositions and appealed to by correspondence. Among these groups his schemes—however visionary at times—for new and extended crops and enterprises found cordial support.<sup>79</sup> For all of the commissioners popular support was needed to meet continual arraignments and periodic congressional investigations.

Incompetence, clearly revealed, and rivalries, personal, commodity, and regional, resulting in unrealized expectations brought investigations, general and special, of the activities of the Department, with threats, especially in the early years,

<sup>72</sup> For a modern discussion of these functions, see M. L. Wilson, *Democracy Has Roots*, 191 (New York, 1939).

<sup>73</sup> Kelley, *Patrons of Husbandry*, 11-12, 19-20, 24-25, 43-44, 58, 330.

<sup>74</sup> Le Duc, *Recollections*, 155-156, 175-176; Le Duc's Office Journal, January 1878, p. 85, and interviews at agricultural fairs, Le Duc Papers. On Jan. 17, 1880, Le Duc wrote to W. W. Pennell of Russell, Kansas, that it would greatly aid the commissioner's forestry program, outlined in his report for 1879, "if all the grangers and farmers on the borders of the great barren plains" would petition their Senators and Representatives with a demand for such aid. Records of the Office of the Secretary of Agriculture, Press Copies of Letters Sent by the Commissioners of Agriculture, 2:591, in the National Archives.

<sup>72</sup> Quoted in William Salter, *The Life of James W. Grimes*, 306 (New York, 1876). Compare a similar opinion by an Easterner, in New York State Agricultural Society, *Transactions*, 1864, p. 518.

<sup>73</sup> True, *A History of Agricultural Experimentation and Research*, 118-123.

<sup>74</sup> U. S. Department of Agriculture, "Proceedings of a Convention of Agriculturists, Held in the Department of Agriculture, January 10th to 18th [1882]," *Departmental Report* 22, p. 49-50, 108-110, 137-147, 155 (Washington, 1882). On the general problem, see E. W. Allen, "Problems of Administering Federal Appropriations to State Institutions," *Proceedings of a Conference on the Relation of the Federal Government to Education*, University of Illinois, *Bulletin*, 29(17):47-58 (Urbana, 1921).

<sup>75</sup> M. S. Eisenhower and A. P. Chew, *The United States Department of Agriculture: Its Growth, Structure and Functions*, 3 (U. S. Department of Agriculture, *Miscellaneous Publication* 88, Washington, 1930).

<sup>76</sup> For instances, *Rural New Yorker*, 15:117 (1864); National Agricultural Convention, Washington, D. C., Feb. 15-17, 1872, *Proceedings*, p. 66-68 (Washington, 1872); Association of American Agricultural Colleges and Experiment Stations, *Proceedings*, Jan. 1-3, 1889, p. 83-89; Hilgard, "Progress in Agriculture. . ." 661.



of further curtailment or even abolition.<sup>80</sup> The saving defense against such attacks came from the Middle West and, with lesser effectiveness, from the South. The West with its agricultural dominance felt that the new service was truly, in Lincoln's phrase, "the people's department," and the region was hopeful of its promotive and protective services.<sup>81</sup> The South was grateful for any encouragement toward rehabilitation and highly favorable to schemes for establishing new major commodities.<sup>82</sup> Thus it came about that from the first the Western and Southern agricultural societies and press were more tolerant and appreciative of the commissioners and of the activities of the Department than were those of the East. This regionalization of support was but one of the reflections of the concentration of farming interests resulting from the needs of the new agriculture which inevitably created new demands upon the public service and mainly determined the future growth and ranking of the Department.

After all, the key to the persistence and progression of this, as of other administrative agencies, was in the scope and nature of its effective functions—in short in its developmental possibilities. The contrast in the careers of the commissioner-headed departments of agriculture and of education, both products of the centralizing tendency of the Civil War, gives striking confirmation.

Along with the continuity of the ultimate aim of

<sup>80</sup> For instance Donnelly's bill for reorganization. *Congressional Globe*, 39 Congress, 2 Session, Dec. 13, 1866, p. 109, Jan. 26, 1867, p. 778; committee of investigation, December 1880-January 1881, testimony of hearing in Le Duc Papers; *Cultivator and Country Gentleman*, 28:400 (1866).

<sup>81</sup> Iowa State Agricultural Society, *Report*, 1862, p. 221, 1863, p. 80, 1864, p. 89-90, 225-256, 1865, p. 89, 1870, p. 22-25; California State Agricultural Society, *Transactions*, 1870, p. 98; *Iowa State Register*, Aug. 17, 1862; *Iowa Homestead*, Jan. 1, 1863, p. 389; *Wisconsin Farmer*, 15:90, 275-277 (1863); *Prairie Farmer* (n.s.), 10:401 (1862), 11:360 (1863), 13:2, 186, 377, 410 (1864), 15:229-230 (1865). Father Clarkson in the agricultural section of the *Iowa Weekly State Register* was a strong supporter of the Department throughout his service (1870-1890).

<sup>82</sup> *Southern Planter and Farmer* (n.s.), 2:82 (1868), 3:379-381 (1869), 42:311 (1881); *Maryland Farmer and Mechanic*, January 1865, p. 20, July 1867, p. 210. Senator Butler of South Carolina praised Le Duc's efforts for tea and sugar production. See *Congressional Record*, 49 Congress, 2 Session, 18 (1):728 (Jan. 17, 1887).

promoting and protecting the agricultural interest, absolutely and relatively, there were changes in the nature and emphasis of the specific objectives corresponding roughly to those going on within the occupation. The first commissioner endorsed the procedures recommended by Jesse Buel two decades before: collection and publication of statistical and other pertinent information; collection and distribution of untried seeds and plants, home and native; correspondence with farmers of different regions with the aim of securing better and more balanced production; "testing, by experiment," agricultural implements and grains and plants; chemical analyses of soils, fertilizers, grains, and plants; "establishing a professorship of botany and entomology" and an agricultural library and museum.<sup>83</sup> All of these services were eventually to be performed, by Federal, State, or combined effort, with ever increasing specialization and discrimination. The constructive and permanent advances were delayed and hampered, however, by mistaken popular desires anticipated by Congress, niggardly or fluctuating support, and the influence of special production groups. Seed distribution involved wastes and abuses in selection and in checking the results. Stimulated by disgruntled dealers, the agricultural journals chronically inveighed against the "seed store" enterprise of the Department, and each commissioner except the first sought to restrict and redirect the expenditure in accord with legal intent. But Congress, with exaggerated belief in the appeal of frank packages to constituents, continued to renew the appropriations for quantity purchases and thus continued the perversion of Ellsworth's helpful project.<sup>84</sup>

Hardly less subject to attack were the departmental publications, reports, and bulletins. The farm journals were especially shocked and indignant at the issuing of periodical reports which,

<sup>83</sup> U. S. Commissioner of Agriculture, *Report*, 1862, p. 20-21.

<sup>84</sup> Hilgard, "Progress in Agriculture . . ." 655-656; Le Duc to E. J. Rees, July 1879, on efforts to regulate seed distribution, in Records of the Office of the Secretary of Agriculture, Press Copies of Letters Sent by the Commissioners of Agriculture, 1:21-23, in the National Archives; Beale, *Diary of Edward Bates*, 463-464. From the days of the Patent Office division, the agricultural papers continually attacked the wastes and abuses involved in the system. The Department files contain endorsements of seedsmen by Senators and Representatives.

they felt, made a public-supported agency a publisher competing with private enterprise.<sup>85</sup> However, the real question was not the amount and frequency of the publications but the peculiar service that they rendered. Competent and impartial observers acknowledged that the statistics, general discussions, and research findings were sometimes incomplete, uneven, and tardy but held that the publications in information and direct availability for serious readers compared favorably with similar ones issued in Europe.<sup>86</sup> The wastes in printing and lavish and indiscriminate, even dishonest, distribution were again traceable to congressional practices.

The most determining influence upon the policies of the Department during the first quarter century was the disproportional emphasis upon new, especially exotic, products. To the neo-mercantilist or pre-economic nationalist view, national self-sufficiency in the largest possible number of items, including if possible tropical "colonial wares," was a *summum bonum*. Hence the major attention from Patent Office days was given to sugar production from Chinese sorghum and beets, to the revival or extension of silk, hemp, and jute cultivation, and to the acclimation of the tea plant culminating in the late seventies in the tea farm demonstration in South Carolina.<sup>87</sup> These persistent efforts to introduce new crops and types of cultivation took no thought of the operation of comparative costs or of the ultimate effect upon foreign commerce; and back of each of the ventures were groups of producers who resisted any attempt to lessen the aid to such alleged sources of national treasure. Consequently measures to improve and stabilize the fullest established systems and to secure the

best long-time utilization of natural resources had to compete with those for the new and unproven.

Functions grew apace, if not always soundly and symmetrically, and divisions multiplied. Each administration was marked by added activities resulting in new units of administration. At the change of status in 1889, the Department had one bureau and ten divisions, each involving lines of specialization in subject matter or supervision.<sup>88</sup> The appropriations had grown from \$64,000 in 1862 to \$1,359,000, and there was also the \$630,000 appropriated directly for the experiment stations.<sup>89</sup> Considering the greatness of the interest involved, the expenditures were modest throughout the period, but the relative increase was impressive.

The increases in functions and support were due largely to two cardinal changes in the aims and methods of the Department that came about mainly in the late seventies and eighties to meet critical problems in the production and marketing of the agricultural surplus. The scientific demands and full commercialized basis of the farm undertaking by that time necessitated new degrees and kinds of governmental services. Regulatory policies were needed to fix and maintain the standards of what the farmer sold and bought. Both in the State and national realms agricultural administration became significant, popularly and politically, with the inauguration of these vital controls. For the Federal sphere the turning point came in 1884 with the establishment of the Bureau of Animal Industry to safeguard the home and foreign meat trade, after extended investigations by distinguished veterinary scientists.<sup>90</sup> The

<sup>85</sup> For typical attacks, see *Rural New Yorker*, 15:390 (1864); *Country Gentleman*, 25:113, 160, 193 (1865); *American Agriculturist*, 24:145-146 (1865); *Cultivator and Country Gentleman*, 31:171 (1868). It was charged that members of Congress at times sold their supply of reports to second-hand book dealers for as little as 10 cents per copy. *Iowa Weekly State Register*, Apr. 27, 1877. The Department's letter files and the correspondence of members of Congress, for example Ignatius Donnelly, are full of requests for seeds and reports.

<sup>86</sup> Hilgard, "Progress in Agriculture . . .," 654-655.

<sup>87</sup> U. S. Commissioner of Agriculture, *Report*, 1867, p. 2-12, 1877, p. 23-47, 349-367, 1878, p. 10, 1879, p. 26-27 (coffee culture!); Le Duc, *Recollections*, 157-166; reports of experiences with new products in Le Duc Papers. Special departmental bulletins were issued on ramie and jute (1873), maize and sorghum sugars (1879, 1880, 1883), and date culture (1883).

<sup>88</sup> U. S. Commissioner of Agriculture, *Report*, 1888, p. 14-47. The development of new enterprises and divisions is traced by commissionerships in True, *A History of Agricultural Experimentation and Research*, and Charles H. Greathouse, *Historical Sketch of the U. S. Department of Agriculture* (Washington, 1907). Edward Wiest, *Agricultural Organization in the United States*, 33-34 (Lexington, Ky., 1923), has a chronological summary of the main lines of development. A rather depreciating description of the Department's organization and equipment in 1889 is given in David Fairchild, *The World Was My Garden*, 18 (New York, 1938).

<sup>89</sup> U. S. Department of Agriculture, *Report*, 1889, p. 8-9; Greathouse, *Historical Sketch*, 67.

<sup>90</sup> U. S. Commissioner of Agriculture, *Report*, 1877, p. 382-527, 1878, p. 321-476, 1879, p. 365-484, 1880, p. 26-33, 1883, p. 17-81, 1885, p. 7-9; Le Duc, *Recollections*, 166; U. G. Houck, *The Bureau of Animal Industry . . .* (Washington, 1924).

basis of such investigations, as well as those involved in combating plant diseases, in improving breeds and strains of animals and plants, and developing better methods of cultivation and husbandry, was the systematic and continuous program of State-Federal sponsored and supported research, provided by the experiment stations.

The system of federally subsidized experiment stations authorized in 1887 by the Hatch Act of which Commissioner Colman was the main author marked a great forward step both for the land-grant colleges and the Department. More than any other influence, the system brought Federal and State agencies into harmonious cooperation. The Office of Experiment Stations served as a convenient and understanding agency, and the formation of the Association of Agricultural Colleges and Experiment Stations, also largely through Colman's efforts, was a further organ of interrelations. Finally the exchange of personnel, administrators and subject experts, between the Department, the colleges, and the stations created interlocking relationships.<sup>91</sup>

These understandings along with the political pressure of farm organizations soon carried "the people's department" to a seat at the cabinet table.<sup>92</sup> While the new secretary did not have under his jurisdiction all of the agencies sought, notably the General Land Office,<sup>93</sup> contrary to

the assumed fears of opponents,<sup>94</sup> there was no lack of policy determining measures and "action programs" in connection with the investigational and regulatory work. Positive aid was not then on the agenda for agriculture, any more than for labor whose more tardy development as a bureau and a department presents an interesting parallel, but for an agency of government committed to the welfare of an occupational interest such advanced action might be argued to have been implicit in the nature and consequent trend of modern industrialism.<sup>95</sup> If so, it may be concluded that all of the complex functions and commitments of the present Department were anticipated, in embryo, in the simpler days of the commissionership.

cluded. Le Duc to Morrill, Dec. 24, 1884, Morrill Papers.

<sup>91</sup> *Congressional Record*, 50 Congress, 1 Session, 4478, 4876, 19(9):8686-8688, 8778, 8781, 8801, 8806 (Sept. 18, 20, 21, 1888), and appendix, 15(10):540 (Sept. 17, 1888). There was a long continuing proposal to join agricultural with other business interests in a bureau or department of industry. This was involved in the early proposals for a "home department" in the recommendations of Fillmore, Clemson, and Holloway, and in the debates on the secretaryship a "department of national industries" was proposed in which all business interests, agriculture, manufacturing and commerce, and labor should be represented, both in the interest of economic fairness and balance and of the harmonizing of conflicting interests. The supporters of the bill contended that the farmers desired their own department for their special needs and protection.

<sup>92</sup> See the suggestive statements in Chew *The Response of Government to Agriculture*, 3; F. F. Elliott, "The Farmer's Changing World," U. S. Department of Agriculture, *Yearbook*, 1940, p. 103-110; Chester C. Davis, "The Development of Agricultural Policy since the End of the World War," *ibid.*, p. 325-326. When the Bureau of Agricultural Economics was established in 1921, the Secretary declared: "The organic law which created the department back in the sixties contemplated exactly this sort of development." *Ibid.*, 1921, p. 18.

<sup>91</sup> True, *A History of Agricultural Experimentation and Research*, 124-134; Colman to Henry E. Alvord, Sept. 22, 1886, in Records of the Office of the Secretary of Agriculture, Press Copies of "Domestic" Letters Sent by the Commissioners of Agriculture, 97:33, in the National Archives; U. S. Commissioner of Agriculture, *Report*, 1885, p. 6-7, 1887, p. 12, 1888, p. 8-14, 537-558.

<sup>92</sup> A. C. True, "The United States Department of Agriculture, 1862-1912," Association of American Agricultural Colleges and Experiment Stations, *Proceedings*, 1912, p. 70-80. See *Congressional Record*, 50 Congress, 1 Session, 19(10):9303 (Oct. 8, 1888), for a summary of action on bills, 1881-1888.

<sup>93</sup> Le Duc thought the land office, the fisheries commission, and the signal service at least should be in-

## THE CATTLE DISTEMPER IN MID-EIGHTEENTH-CENTURY ENGLAND

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For at least a dozen years, 1745–1757, a murrain made such tragic inroads upon the cattle of England that the virtual extinction of entire herds was frequently recorded. Within the period of greatest mortality, at least half a million cattle perished from the disease or were killed by official orders. That such a catastrophe had many consequences goes without saying, but the whole episode has escaped comprehensive investigation. Although the loss to farmers, disruption of agriculture, and effects on diet<sup>1</sup>—to list no other social and economic dislocation—would well repay examination, the following pages will concentrate on veterinary medicine, primarily as revealed in the *Gentleman's Magazine* and the *London Magazine*. Inevitably, a murrain of such length and proportions inspired many suggestions as to its origin, nature, and cure. These varied from trivial items to exhaustive analyses, from simple specifics to surveys of the history and literature of the subject. Contributions came from laymen, farmers, and physicians. Some

writers chose to describe; others preferred to controvert. Some were brief; others were verbose. Some stopped with a single piece; others returned to the exposition of their opinions. Yet whatever their character, these writings—whether theory, fact, or conjecture—establish the mortality of the distemper and the widespread attention it aroused. Likewise they uncover a historical phase of animal husbandry and contribute to the general history of science.

Despite these considerations the historian of science as well as the more general historian has passed by the cattle distemper as if the maladies of lower animals were unworthy of his attention. The historical study of comparative pathology has often been neglected even though animal plagues and human pestilences have on occasion gone hand in hand. The one substantial work on the subject, by Dr. George Fleming, came out over seventy years ago.<sup>2</sup> Though containing a vast amount of information, it was compiled rather than composed, and much remains to be done along the lines he marked out. He gave considerable space to the distemper under discussion here, but his content takes the form of extensive quotation from a relatively few sources. Highly significant in themselves, these are too limited in number and character to present a complete picture. Moreover, his practice of lifting several pages in a block rather than abstracting the entire work means that he disregarded certain materials and viewpoints in the author used.

Before considering the murrain of 1745 and after, it is of value to turn briefly to England's cattle plague of 1714, especially since the first significant

<sup>1</sup> Elizabeth Purefoy wrote her London agent on Jan. 9, 1745/6, thanking God "wee have not one cow amiss at Shalstone, nor within twenty miles of us only at Shenley & Newton Longueville; about 10 miles from hence one Mr. George bought a distempered cow of a London dealer & unfortunately putting her amongst his other Cows hee lost seventeen which were all hee had. There was the same case at Newton Longueville, but I don't hear it has spread. Our Butcher, Mr. Ben: King told mee hee had 40 fat cows, the worst of them worth twelve pounds & if ye Distemper shall fall upon his Cattle it would undo him . . . . Our parishioners have sent a certificate to London that our cattle of all sorts are in good health, so our butter and every thing wee send to Town from hence is highly accepted." On Oct. 29, 1746, however, she regretted that she would be unable to supply him with butter any longer, for her two cows were inadequate and she "durst not buy any cows, the Distemper being within 5 or 6 miles of us." *Purefoy Letters, 1735–1753*, ed. by G. Eland, 2:229, 403 (London, 1931).

I am greatly indebted to the University of Missouri Research Council for assistance in working out this problem.

<sup>2</sup> George Fleming, *Animal Plagues: Their History, Nature, and Prevention*, 1:174–175 (London, 1871), points out that England was very backward in the study of comparative pathology even in the nineteenth century and that, although France had its first veterinary school in 1762 and others were founded during the next decade in almost every central and western European country, England did not have one until 1792 and it was not state-supported.



contributions in 1745 refer to it as do others later on.<sup>3</sup> Between 1711 and 1714 a distemper swept over Europe with such disastrous effect that 1,500,000 cattle were carried off. Leading physicians, such as Bernardino Ramazzini and Giovanni Lancisi, turned their attention to it and established, if they did not inaugurate, the study of comparative pathology.<sup>4</sup> A lesser known English-

man, Thomas Bates, interested himself in the problem and suggested policies which the government accepted with such promptitude and success as to excite the admiration and applause of Europe.<sup>5</sup> Whether or not Bates knew the ideas of

bleeding and for administering powdered herbs in warm beer. *Ibid.*, 50.

Giovanni Lancisi (1654-1720), Italian physician of wide training and experience, was at one time physician to Pope Clement XI (1700-21). He saw the distemper, the symptoms of which he fully described in *Dissertatio historica de bovillia peste* (1715), as a virulent contagious poison passing from beast to beast through breathing or food and transmitted not only by the cattle themselves but also by other animals, birds, and men. He believed in segregation and quarantine and had no faith in cures; he emphasized diet, opposed weakening medicines, recommended killing infected cattle, and adhered to the Hippocratic injunction: "So act that if you do no good, you at least do no harm." On killing the animals men should take care to spill no blood, to remove no hair, and to bury deep; fumigation of clothes, sheds, and the like was also essential. He did not know whether eating the flesh of diseased cattle would cause harm, but he advised caution and opposed drinking their milk. Through Lancisi's recommendations the Roman area quickly got rid of the disease and with relatively slight mortality.

That Lancisi and Ramazzini, however, were not alone in their interest appears from Dr. Peter Anthony Michelotti's "Account of a Contagion among the Cattle in the Venetian Territories, in Autumn 1711," presented to the Royal Society in 1720. He described the cattle's refusal of food and drink, their shiverings, fluxes, tumors, quickened pulse, and coagulated blood. This last he thought the cause of the fever. *Philosophical Transactions*, 31:83.

<sup>5</sup> For a good account of Bates (fl. 1704-19) see Fleming, *Animal Plagues*, 1: 209-224. Bates had been a naval surgeon for 5 years when he wrote his *Enchiridion of Fevers Common to Seamen in the Mediterranean* (1709). Later on, he became surgeon to George I and practiced in London. In 1718 he presented his ideas on the cattle distemper to the Royal Society, of which he was a member, in "A Brief Account of the Contagious Disease Which Raged among the Milch Cows near London in the Year 1714, and of the Methods That Were Taken for Suppressing It," *Philosophical Transactions*, 30:872. This statement was in turn summarized in the *Gentleman's Magazine*, 15:528 (1745), where it had extensive influence under the title, "Directions Recommended To Be Observed in the Present Incurable and Contagious Distemper among the Cows."

The *Gentleman's Magazine* was published monthly,

<sup>3</sup> Englishmen had also been informed of earlier cattle distempers. In 1683 the Royal Society of London, *Philosophical Transactions*, 13:93, contained an "Account of a Murrain in Switzerzeland, and Its Cure" by a Dr. Wincler. This writer described how a contemporary epidemic had spread from Italy into Switzerland and Germany, seeming to propagate itself in the form of a blue mist. The infected cattle which died within 24 hours invariably had enlarged and corrupted spleens. People who managed their cattle carelessly often died of the infection. Wincler thought that the infection might have proceeded from noxious exhalations from the earth, induced by quakes. For cure he recommended cleansing the tongue of the beast and administering a mixture of soot, gunpowder, sulphur, salt, and similar substances. From this communication and many testimonies of later date it is quite apparent that in the seventeenth and eighteenth centuries continental countries often suffered drastically from cattle plagues which England escaped.

<sup>4</sup> Bernardino Ramazzini (1633-1714), if less sound than Lancisi, is perhaps better known because of his memorable study of occupational diseases. When the distemper became active in northern Italy in 1711, he turned his attention thereto in an influential dissertation, *De contagiosa epidemia quae in patavino agro, et tota fere veneta ditione in boves irrepsit*. For him the murrain was a deadly and malignant fever similar to or even identical with smallpox. He described the symptoms and nature of the distemper, its rapid rise and spread, and the various post-mortems he had conducted. Contrary to Wincler he maintained that the disease affected cattle only, but he admitted that human beings could carry it. He recommended bleeding, rowelling, alexipharmics, cordials, and fumigation. His comments, as did those of Lancisi, anticipated many of the systematic expositions summarized below. See John M. McDonald, "Ramazzini's Dissertation on Rinderpest," *Bulletin of the History of Medicine*, 12: 529-539 (1942); Fleming, *Animal Plagues*, 1:186-206; and Royal Society of London, *Philosophical Transactions*, 29:46 (1714). The Royal Society also showed its awareness of the situation by publishing in 1714 "A Recipe: or the Ingredients of a Medicine for the Spreading Mortal Distemper among Cows; Lately Sent over from Holland, Where a Like Distemper Raged among the Black Cattle." This called for



Lancisi is not clear, but he fell only slightly behind that distinguished physician, and in many respects his opinions strikingly resemble those of the Italian.

When the distemper invaded England in the latter half of 1714—apparently for the first time in the country's history—Bates carefully observed its symptoms and course; he then recommended procedures which the government in general adopted. In his account before the Royal Society of London he declared his conviction that the want of natural purgation alone caused the disease, and he attributed this lack to the poor grass resulting from the recent drought which had prevented the cattle from being naturally purged as usual in the spring. (By contrast, the season preceding the 1711 outbreak in Italy had been cold and wet.) In the early stages the cattle had no appetite, coughed, and voided hard excrement. Discharges from the nostrils, nauseous breath, and severe purging followed. Where death overtook the beast it usually occurred anywhere between 3 and 10 days, with bulls living the longest. Bates noted that wool and linen communicated the disease and that more cows died from the infection carried by cowhands than by the original putrefaction. Consequently he had advised cowkeepers with well cows to avoid sick cows, to kill any cow immediately upon infection and bury it at least 6 feet deep covered with lime, to refrain from using the pasture or milking place of sick cows for 2 months and their houses, which should be thoroughly cleansed, for 3 months, and to have only small herds. He believed the milk and flesh of diseased cows to be useless if not downright dangerous. Having conducted numerous post-mortems to explore the effects of the distemper and discover new treatments, he had no faith whatever in the prescription from Holland.<sup>6</sup> To encourage

beginning in 1731. It contains both original articles and digests, excerpts, and articles from contemporary publications. Most of the contributions are unsigned. Similar in character is the *London Magazine*, which began publication in 1732 as a rival to the *Gentleman's Magazine* and has the same general arrangement. C. Lennart Carlson, *The First Magazine; A History of the Gentleman's Magazine* (Providence, 1938) is informing on the career of the two journals. The *Scots Magazine* (Edinburgh, 1739–1826) also resembles these two, as does, to a lesser extent, the *Universal Magazine* (London, 1747–), both of which have been used. Some of the material incidentally appeared in all four periodicals.

<sup>6</sup> Published in *Philosophical Transactions*, 29:50 (1714). See note 4 above.

the killing of infected cattle he had recommended compensation of 40 shillings per cow to the owners. Because the government had accepted his advice the distemper had run its course in about 3 months. Although some 6,000 cattle had died or been killed, the loss—which Bates estimated at about £58,000—was trifling compared to the continental loss and to the English cost at mid-century.

Meanwhile, as the occasion for the republication of Bates's ideas in 1745, the distemper had been introduced into England from Holland in hides or by calves and had spread from Essex to Berkshire through cows purchased at a fair. Thence it quickly extended to other parts of England and not until 1757 had it worn itself out sufficiently to warrant confidence that it was over; even then traces of the distemper survived to such an extent that various parts of the country suffered mildly for another dozen years. Why this epidemic lasted so long and proved so fatal has not been explained. The ideas of Bates were available; the earlier visitation was not so far in the past that it had been entirely forgotten; and finally the theories of Ramazzini and Lancisi were immediately recalled and set forth. On the other hand, no Bates or Lancisi emerged in person at the onset of the murrain to recommend a course that the government would follow. Factors of climate and feeding may have prepared the way for a much more serious onslaught than that of 1714. Such political problems as the War of the Austrian Succession and the Jacobite Uprising no doubt distracted attention from the humble but not less critical ailments of cattle. Veterinary science as represented by the ignorant cow leech was backward. Medical men, even the able, skillful, and willing, had little or no knowledge of comparative pathology. All such considerations must be borne in mind in judging the situation of the mid-eighteenth century.

The earliest comments on the visitation stemmed from European circumstances, for western Europe had been ravaged for 4 or 5 years, and some Englishmen anticipated that England would be affected.<sup>7</sup> One correspondent reported the ravages

<sup>7</sup> *Scots Magazine*, 1: 373 (1739), published a recipe, illustrating that the continental situation excited attention in Britain. This prevention and cure of the murrain called for salad oil, angelica water, treacle, and powdered fenugreek, bole ammoniac, madder, tumeric, saffron, and aloes, mixed with strong ale; each beast was to have a pint at first symptoms.

and treatment in Flanders.<sup>8</sup> Another, prompted by an analytical and historical French treatise, contributed some important suggestions.<sup>9</sup> He quoted Ramazzini and Lancisi concerning the 1711 visitation which was marked by fever, gangrene in the lungs, liver, and intestines, difficult breathing, sunken flanks, dry tongue, loathing of food and drink, lassitude, black spots inside, and postules—characteristics also of the existing distemper. Neither physician, he said, had found a sure cure; and whereas Ramazzini favored bleeding, Lancisi opposed it. He himself prescribed Epsom or Glauber's salts, good hay and a small quantity of oats or barley (Lancisi preferred liquid to solid food), segregation, cleanliness, deep burial of the dead—Pope Clement in 1711 had recommended burning them far from human habitation—and warm drinks and sweats. Finally, he believed that many human medicines benefited animals and that physicians could learn much from treating beasts, as witness Lancisi's observations in 1711.

When this author turned from the Continent to England, and from description to prescription, he suggested policies which, if they did not directly stimulate action, were at least attempted, and he inaugurated disputes over the nature of the disease, coeval with the distemper itself. If the weight of opinion, official and medical, assumed the murrain to be contagious, the bulk of the contributions—especially recipes but also essays—postulated the reverse and found the cause in other factors. In any case within the next few years hundreds of cures and conflicting solutions were given to the public.

In 1745 a member of the Royal College of Physicians of London argued the theory of spontaneous generation.<sup>10</sup> Dr. Theophilus Lobb favored segregation in a sort of pesthouse and stressed the need for research into the causes and character

of the disease.<sup>11</sup> This was essential in view of the persistence with which men sought to combat the distemper with medicine rather than preventive measures; their tactics spread the virus instead of checking it.

Although many writers admitted their ignorance of the causes of the distemper, one influential contributor described it as a violent inflammatory fever resulting from a green grass diet which, owing to excessive moisture, was juicier than in some years and, following upon a long regimen of dry food which chilled the blood, made the cattle susceptible to colds and fever. To bear out his contention he printed a farmer's journal.

Oct. 20, 1745. Late in the Evening four of my Cows were taken with the Distemper that has been so fatal . . . that few of the Farmers have sav'd one in five of the Cattle that have been taken; but most have lost their whole Stock.

21. I sent for a Cowleech . . . who gave them Drink which he pretended was a great Secret; he bled them plentifully in the Tail, rowell'd or coaz'd them in the Dewlap, by my Order.

Half an Hour after the Drink I gave one Ounce of Salt-Petre, dissolv'd in Spa Water, to each Cow;

Royal Society by another French physician, John B. N. Boyer (1693–1768). Most of the pamphlets on the distemper, which sold for sixpence or a shilling, were anonymous and are now both scarce and difficult to find. Running down the authorship, correct titles, and editions would be a sizable and worthwhile bibliographical task, made the more difficult by the common practice of issuing a second edition or impression of a given work under a different title from the original. Nothing more has been attempted here than to supply *as correctly as possible* the author, title, dates, and content of such pamphlets as have been discovered. For the tracts I have not personally seen I have depended on the published catalogs of the United States Surgeon General's Library and the British Museum, Robert Watt's *Bibliotheca Britannica* (Edinburgh, 1824), and the publication lists in eighteenth-century periodicals, all of which are incomplete or faulty.

<sup>11</sup> Theophilus Lobb, *Letters relating to the Plague and Contagious Distempers* (London, 1745). Lobb (1678–1763) was educated for the nonconformist ministry in which profession he engaged for many years. Coming under the influence of a physician who gave him instruction, he began to practice medicine in 1706 with great success, though at the same time he continued preaching. After 1736 he applied himself wholly to medicine, becoming a licentiate of the Royal College of Physicians in 1740. He wrote a good deal, especially on fevers, the stone, and the general practice of medicine.

<sup>8</sup> *Gentleman's Magazine*, 14:567 (1744). This contributor related that the spleen and lungs of infected cattle had dried up; to effect a cure the peasants buried the animals in a mudhole leaving only the heads exposed. After 9 hours they were dug out and found to be well.

<sup>9</sup> *Ibid.*, 585; *Scots Magazine*, 6:511–515 (1744).

<sup>10</sup> *An Account of the Present Epidemical Distemper amongst the Black Cattle, together with a Method of Cure* (1745, 1746). See also *An Account of the Disease then Epidemic among Cattle* (1745) by the French physician, John B. L. Chomel (1700–65). Another early piece, generally descriptive in character, was *A Memoir on the Diseases Infesting the Cattle* (1745), sent to the

which Dose I repeated twice more this Day, observing to be about five Hours between each Dose.

The Cows refus'd their Food, but, to prevent them from starving, I boil'd about three Quarters of a Peck of Oats in as much Water as a Cow may be thought to drink in one Day; which Quantity, at sundry Times in the twenty-four Hours, I gave to each Cow, in a Horn, Water and all, and a Malt-Mash of a Quarter of a Peck of Malt. I also gave each Cow two Quarts of Sugar-Sops, wherein much Cinnamon was boil'd, viz. one Quart about Noon, and the other in the Evening.

I kept them in the House warm litter'd, and kept milking what little they had, and threw it on the Dunghill. A Man and Boy set up all Night with them.

22. They were very bad, cough'd much, run at the Eyes, and breath'd very quick. I repeated the same Medicines, and took the same Care; but they fell away surprisingly. A Man and Boy still set up to nurse them.

23. They were somewhat better; I repeated the same in every Particular.

24. They were much mended, and began to eat a little Hay: I now left off the Salt-Petre and the Drink, but continued the Oats and Sugar-Sops.

25. They were so much better, that [I] ventured to drive them to some good Grass, about a Stone's-Cast from the Cow-house, where they continued picking about an Hour; during which Time, a Boy was constantly with them, to prevent them from laying down on the wet Grass, which I apprehended would kill them. This Day the Boy drove one of them into the Pond where it drank eight Go-downs: At Night I thought it would have died, but is since likely to recover.

26 and 27. These Days I continued to take Care of them without giving any Medicines, but gave them boiled Oats, good Hay, and Sugar-Sops, which they would eat very heartily. I have all Reason to believe they will do very well.

I had three more taken on the 21st, which were indeed very bad; but I think we discover'd their Illness a Day, at least, sooner than we did the first Cows; so that by early Application of the Remedies they have recovered their Strength and Appetites better than those first taken.

I know the Cowleech us'd one Quart of Wood Soot to each Drink, with sundry bitter Herbs, viz. Red Sage, Wormwood, Rue, and Smalage, which were boil'd in Ale, with half a Pound of Hogs-Lard.

N.B. I believe *Sperma Ceti* much better.<sup>12</sup>

<sup>12</sup> *London Magazine*, 14:557-559 (1745). Much of this material also appeared in *Gentleman's Magazine*, 15:573-574 (1745). Other recipes praised bleeding and administering saltpeter in warm water, and purging. A physician writing from Paris approved sparse fodder, segregation, some exercise, and blistering, but regarded bleeding and purges as ineffective if not bad, and even

The article also suggested numerous recipes. One very successful Swedish cure called for roots of snakeweed, valerian, lovage, elecampane, masterwort, angelica, and carline thistles, and for camphor, laurel berries, and agaric, which, when properly measured and reduced to powder, were mixed with approximately equal weight of salt. After the cattle had been housed over night, "the next Morning must be given to each, on toasted Bread, when fasting, as much of the above Composition as can be taken up with your Thumb and Fingers. The Beast must neither eat nor drink before Mid-day." Thereafter the owner need not worry. Another remedy required rue, wormwood, and rosemary, bruised in a mortar, boiled in ale, and strained; garlic and houseleek juice and Venice treacle should then be added. A third was compounded of Venice treacle, lapis contrayerva, powdered rhubarb, powder of saffron, camphor dissolved in wine, and oil of caraway, mixed and given in a drench, bloodwarm, with mint, wormwood, and rue water. The medicine, best when made into a ball, might be "faithfully prepared for one Shilling and Six-pence: For which Reason, the Author has, for the Benefit of the Publick, ordered them to be sold for that Price . . . three Doses will be sufficient for a Cure; and by Way of Prevention to the sound Cattle, one Ball may be divided into two Doses." Meanwhile, the beast must be kept warm, given a mash of ground malt or boiled oats, and supplied with warm water.

Motivated no doubt by such specifics, some physicians, who planned to meet every Monday until further notice, pointedly informed the public in November 1745 that other factors than the richness of the grass caused the distemper which might be communicated by animals or by men.<sup>13</sup> Every farmer should exclude strange cattle from his barn and pasture. If his cattle became diseased, he should bury the cattle that died, bury their litter and excrement, cleanse their stalls by washing and steaming with vinegar poured on hot iron, and let those places stand empty as long as possible. No attendant on diseased cattle should be allowed among well animals.

rated blistering an incomplete treatment. *Ibid.*, 528, 600-601. The *Scots Magazine* reported that 6,000 black cattle had been carried off in Argyleshire, Scotland, by May and referred to the enormous mortality in Denmark. Prompted by such losses the editor supplied some recipes (6:142, 243, 275, 605).

<sup>13</sup> *London Magazine*, 14:568 (1745).



Though these physicians considered the disease as arising from infection they likewise concluded that its violence might be increased or diminished by several circumstances.<sup>14</sup>

It had been found, that the Cattle, whose Paunches were stuff'd with the luxuriant Herbage, in case they were attack'd, suffer'd extremely. We therefore requested the Farmers, &c. to house their Cattle earlier at Night; to be sparing of their Fodder; not to drain them too much by Milking; in a Word, to keep them in tolerable Condition, with as little superfluous Food as possible.

After the Cattle were once seized, Evacuations were found to be injurious: Few were observ'd to recover, which had either been plentifully blooded or purged: Pegging, as it's call'd, (or Rowelling) in the Manner it was practised, had not been of much Use: Nevertheless, from the concurrent Testimonies of the best Writers upon these Diseases, and the Reasonableness of the Thing itself, we recommended several such Openings to be made, in the Manner of a Seton, by running a hot Iron through the double Skin under the Jaw, and in one or both Flanks, and there introducing a Cord thro' the Hole, smear'd over with blistering Ointment: The Cord ought now and then to be moved, in order to promote a plentiful Discharge.

Supposing the Course of the Disease to be divided into three Stages: In the two first we apprehend proper Remedies might take Place; in the third, Death appear'd inevitable, as a Mortification has then seiz'd the Entrails. The Medicines we recommended, with some little Variation in the Proportion and Dose, were the following.

To a Gallon of Water put a Pint of Honey, or a Pound and a half in Weight, and a Pint of Vinegar; let these be gently simmer'd together.

Take Saltpetre, four Ounces; Camphire, half an Ounce; Liquorice Powder, six Ounces; and Honey, a sufficient Quantity to make them into a Ball; let this be divided into four equal Parts, one whereof may be given, dissolv'd in a Quart of the Liquor above describ'd, warm, every six Hours.

These were to be given from the first Seizure, at least as soon as the Distemper was discover'd, and to be continued the two first Days. The following was then to be used in its Stead, viz. take *Peruvian Bark*, six Ounces; *Virginia Snake-Root*, an Ounce, both in Powder; mix and divide them into four equal Parts, one of which may be given every Morning and Night, and to a strong Beast at Noon also, in a Pint and a half of warm Beer.

\* \* \*

We urg'd the Necessity of keeping the diseas'd Cattle within Doors, and even in as warm Houses as

possible, frequently steaming them with Vinegar, gently pour'd on hot Irons; that they should have warm Liquids, such as Water-Gruel, Barley-Meal boil'd in Water, and very thin Mashies, given them in Plenty, at least every two Hours: As the Disorder abates, their Gruel, Mashies, &c. may be made thicker and more nourishing.

\* \* \*

Since our first Directions were given out, we have apprehended, that if the Rattle-Snake-Root was substituted in the Room of the *Virginia*, and join'd with the Bark in the following Manner, the Prospect of Success would still be the greater.

At their first Seizure, take away about a Quart of Blood, (the loss whereof will not here be prejudicial, the Remedy supplying the Strength which would be diminish'd by it) then give a Dose of the following Powder in a Quart of the Honey Liquor above describ'd every Morning, Noon, and Night, viz. Take three Ounces of *Peruvian Bark*; an Ounce of Rattle-Snake-root, both in Powder; mix and divide them into three equal Doses.

Concluding with this that they had given sufficient attention to the matter, the physicians announced the discontinuance of their meetings in order not to clash with the Privy Council's investigation.

Before examining governmental policy some consideration may be paid to the data presented to the Royal Society by Dr. Cromwell Mortimer on three occasions in the winter of 1745-46.<sup>15</sup> Because he saw need for a rational method of treatment and its steady pursuance he described rather completely the symptoms of the distemper and proposed various aids for infected cattle. He believed the murrain to be an inflammation of the lungs and intestines and attended with an enlarged gall

<sup>15</sup> "Some Account of the Distemper Raging among the Cow-Kind in the Neighbourhood of London; with Some Remedies Proposed for Their Recovery," "Further Observations on the Distemper Now Raging among the Cow-Kind," and "A Third Account of the Distemper among the Cows," *Philosophical Transactions*, 43:532, 549 (1745); 44:4 (1746). These were summarized in *Gentleman's Magazine*, 16:650-652 (1746); 17:55-56 (1747). Mortimer (d. 1752), secretary to the Royal Society at this time, was educated at Leyden under Hermann Boerhaave, the great Dutch physician, and later practiced in London where he engaged in a protracted dispute with apothecaries; he became a fellow of the Royal Society in 1728 and of the College of Physicians in 1729. He began his account of the distemper by recalling that physicians at all times had not deemed it beneath their dignity to consider animal disorders. He wrote variously on medicine.

<sup>14</sup> *Ibid.*, 598-600.

bladder. At its appearance farmers should administer a warm malt mash or a drench of caraway seeds, white wine, and honey; they should also lance the gums and rub them with vinegar and salt. Although he thought prescriptions and bleeding of little value, Mortimer favored evacuations. Crocus metallorum might expel gall; vinegar and salt would encourage sneezing; whale oil, treacle, and sulphur in bran or malt mash would relieve shortness of breath; and whiting, bole ammoniac, treacle, and malt would halt excessive purging. He described many post-mortems and noted that the milk of infected cows was rank.

When Mortimer wondered how the distemper attacked its victims, one of his listeners related its transmission from Holland and explained also that sheep carried it in their wool. Another noted that cattle on high land did not succumb. A "learned Danish" gentleman reported that the infection had entered Denmark in raw cattle hides, and another member recalled how a farmer in helping a neighbor with sick cattle had conveyed the infection in his clothes to his own herd which had been almost entirely swept away. Therefore, the segregation of sick cattle was recommended, with a keeper who never went near sound cattle.

Meanwhile, governmental authorities had begun to move. A commission to study the distemper in Middlesex appointed cowkeepers and butchers as inspectors and instructed them as follows:

1. To inspect cow-houses, and to separate sick from sound cows.
2. To see that all cow-houses and yards were kept thoroughly clean.
3. To kill all sick cows and calves, to slash their hides so as to render them useless, with several cuts from head to tail and round the body, and then to bury them in graves ten feet deep, with two bushels of unslacked lime to each cow.
4. To certify to the destruction of the cows, for each of which the Treasury gave 40s.
5. To see that proper returns were made by cow-keepers as to their losses.<sup>16</sup>

This action and the prospect of more aroused debate in the *Gentleman's Magazine*. One critic, arguing that the distemper was not infectious or contagious but derived from poor feed, felt that the

government was too precipitate and that people should not hastily kill their cattle since remedies might save them.<sup>17</sup> On the other hand, the editor desired governmental action. He applauded the plan of killing infected cattle and refuted the idea that rank and poor feed caused the murrain.

The first general statute (February 1746) empowered the King to prohibit the removal, sale, and importation or exportation of cattle and hides, and to regulate burials.<sup>18</sup> The penalty for convicted persons was £10 or 3 months' imprisonment. Under the act the government in March, proclaiming that the epidemic unless halted might totally destroy English cattle, ordered the reading of the rules on the next Sunday after their receipt and on the first Sunday in every month in all parish churches and chapels.<sup>19</sup> Offenders were subject to a penalty of £10, half to the informer and half to the poor of the parish.

Because, said the proclamation, doctors believed that many cures actually propagated the infection, the government requested farmers to observe the following rules: (1) Kill all ailing cattle with as little effusion of blood as possible, slash their hides, and bury them at least 4 feet deep; (2) Burn their fodder and litter and keep their herdsmen from going near sound cattle in the same clothes; (3) Clean with pitch, tar, sulphur, and gunpowder all cowsheds, keeping in as much smoke as possible, wash them frequently with warm water and vinegar, and exclude sound cattle therefrom for at least 2 months; (4) Segregate cattle recovering from the distemper from sound cattle for at least a month and keep them well curried and washed with vinegar and warm water; (5) Sell no milk or flesh of infected animals or let it be fed to any other animals and permit no distempered cattle to be driven to any fair or market or any place whatsoever; (6) Take no cattle from a farm which had had the infection within the past month; and (7) Notify the parish officials or any inspector appointed by the justices of the peace immediately on the appearance of the murrain. These justices were to make rules and divide the responsibility. As soon as the distemper was evident a cattle

<sup>16</sup> Fleming, *Animal Plagues*, 1:285. The policy of burying cows "dead of the present reigning Distemper, in Lime or not" was discussed in 1746 in a letter by Dr. James Parsons, introducing a remark from John Milner who advised burying infected cattle deep, without lime. *Philosophical Transactions*, 44:224 (1746).

<sup>17</sup> *Gentleman's Magazine*, 15:630-631 (1745).

<sup>18</sup> 19 George II, c.5.

<sup>19</sup> *Handlist of Proclamations, 1714-1910*, p. 65 (*Bibliotheca Lindesiana*, 8, Wigan, 1913); *London Magazine*, 15:137-138 (1746); *Gentleman's Magazine*, 16:132-134, 706 (1746). This proclamation was re-issued on Dec. 17, 1746. *Handlist*, 68.



census was enjoined. The farmers were to gather the dung of infected cattle for deep burial. Inspectors were appointed; justices, constables, and clergymen could issue certificates when the infection had passed. Finally, the King promised compensation for every beast killed, not exceeding 40 shillings for each cow or 10 shillings for each calf, the numbers and values to be ascertained by the oaths of the owners.

Despite physicians' recommendations and governmental orders, a certain Dr. Barker dismissed the idea of infection and contagion.<sup>20</sup> He emphasized the presence of a wet season before its arrival in each country and thought that the severe frost of 1740 might have contributed to its intensity in England since that winter had adversely affected all vegetable life. The rank coarse sour forage had suffered much less than the sweet nourishing grass. Pastures also had been damaged by the 2-year drought which admittedly prevented the coarse grass from growing too luxuriantly, but the recent heavy rains had washed dressings into the soil. The resultant rank growth was full of moisture and less nourishing, and the hay was of poorer quality. The distemper did not flourish on the poorer soils. Because it had increased with the frosts, the distemper clearly proceeded from crude aliment and not from infection in the air. The writer favored bleeding, dry fodder, and warm water gruel, and he recommended rolling the pastures to correct rankness and aid the finer grasses. Farmers should not turn their cattle into pastures lately dunged; and if the spring proved cold and wet, cattle should have only dry food.

On the opposite side another author presented the conclusions of Ramazzini and Lancisi.<sup>21</sup> Peculiar to cattle the distemper had come from Hungary and spread by contagion. Although the two physicians had differed on bleeding, the author believed it a safe, even necessary, expedient; its failure resulted from postponement or indifference to the condition of the cattle. Blistering and rowelling let out the foetid matter; washing the tongue with salt and vinegar was helpful; curry-

combing to bring freer perspiration aided discharges; and cleanliness and fumigation were indispensable. Among internal medicines, vinegar with mint, rue, sage, and similar herbs received approval.

Similar views came from Richard Brocklesby who argued that a physician needed something more than a knowledge of the human body since the health of mankind depended largely on the materials used for food.<sup>22</sup> From the whole picture Brocklesby concluded that contagions might be propagated by infected materials of which the most apt were imported from Holland and that the disorder did not come from the atmosphere. One beast infected its fellows. The local symptoms were identical with those in Holland, and newly imported cattle immediately fell sick. Cattle might develop immunities so that one man's herd would remain whole in the midst of the distemper which like the plague moved west. Among the suggested remedies were bleeding, blistering, warmth, a physic composed of vinegar, bran water, and treacle, and washing with tar water and hog's lard. Covering corpses with quicklime, though enjoined by public authority, released even more putrid fumes; it was better, therefore, to bury them 8 to 10 feet deep, a view which Parliament ultimately accepted. The flesh of infected cattle might safely be eaten if it remained untainted for 3 or 4 days unsalted.

Despite the denial that the infection came from the air, some "conjectures" affirming the contrary appeared late in 1746.<sup>23</sup> An author, who discussed origins rather than cures, compared the existing murrain to that of 1714 which he described as so infectious that if one cow had it all others within scent or grazing in the same field also got it. After 4 days of running at the nose and of nauseous breath, the victims died. The distemper resembled the plague, and herdsmen, denying it to be the murrain, declared that it came from insects brought

<sup>20</sup> *Gentleman's Magazine*, 16:79-80 (1746). This was probably John Barker (1708-48) who took his M.D. at Oxford in 1743 and became a member of the College of Physicians in 1746. He was at one time an army physician; his chief literary work was *An Inquiry into the Nature, Cause and Cure of the Present Epidemick Fever* (1742).

<sup>21</sup> *Gentleman's Magazine*, 16:87-88 (1746).

<sup>22</sup> *Ibid.*, 121-122. Richard Brocklesby (1722-97) was Edmund Burke's contemporary at an Irish school. He took his M.D. at Leyden in 1745 and also had degrees from Dublin and Cambridge. His first publication was the essay summarized here, *An Essay concerning the Mortality, Now Prevailing among the Horned Cattle, in Several Parts of Europe, and Chiefly about London* . . . (London, 1746). He later became interested in military hygiene; and he was opposed to the powerful school of iatro-physicians.

<sup>23</sup> *London Magazine*, 15:673-676 (1746).

in by the dry summer and easterly winds. A Low Country medicine composed of strong herbs, tar, and the like had proven ineffectual in England. French and Italian farmers largely depended on fumigation. In England in 1715, when the cows were turned into the fields occupied by distempered cows the year before, they did not get the infection, but when put into the old stalls they died. The insects had survived in the sheds but not in the fields, which proved to the author that thorough fumigation was the proper remedy.

A final proposal in 1746 for preventing the distemper that was above the category of recipes came from an "eminent physician" who signed himself "J.S." He advised, when the cough was discovered, taking the cow from grass, cleaning her with warm water, and keeping her dry, warm, and well supplied with fresh straw. Some little white spots in the mouth, it was said, preceded the cough. During the first 2 days feed her only hot bran mash; thereafter boiled oats were good. Let the drink be warm and frequently administered. The author also prescribed drenching with Glauber's salts, rowelling, doses of vitriol and saltpeter, and large and timely bleedings.<sup>24</sup>

Throughout 1746 many correspondents attributed the distemper to "crude aliment" and suggested cure-alls. Among specifics few inspired greater confidence than Bishop Berkeley's tar water which reflected the common conviction that any disease must give way before a strong medicine. Although it would be tedious to quote all the prescriptions a few will illustrate the prevailing opinion. A quart of strong tar water every hour or two during the first day, so it was said, performed miracles; afterwards the quantity could be reduced, but the animal must be kept housed and warm during the treatment.<sup>25</sup> Some gentlemen, who had diligently inquired into other recipes, gave "a quarter of a pound of tar every day by way of prevention—a cowkeeper at Edmonton having saved two out of three by it;" and to water gruel or warm water they added spirit of vitriol.<sup>26</sup> Another recipe called for a liquid diet with malt, bran, tumeric, saltpeter, and sulphur, and bleeding. A fourth, which cured 8 out of 13 cows, included

new verjuice, soot, saltpeter, sulphur, mustard, tar, linseed oil, honey, and goose grease.<sup>27</sup>

As was natural, controversies arose over the nature and treatment of the distemper. Barker was applauded and attacked for contending that the distemper was not infectious, and his regimen was alike praised as highly successful and denounced as contrary to medical and governmental authority. He himself testified that his method had saved one entire herd and the great majority of another. Four Worcester physicians reportedly subscribed to his principles.<sup>28</sup> Another supporter, who lauded Barker's ideas both for cure and for prevention, recommended that at the first symptoms the cow should be kept dry and clean for several days and drenched with a concoction of water, saltpeter, and oil of vitriol, vinegar, or verjuice.<sup>29</sup> The food should consist of hot mash and frequent doses of water gruel moderately soured with vinegar or verjuice, and the dewlap should be rowelled. If caught in time the cattle should show improvement in 2 or 3 days. If prevention failed the farmer should then follow the government orders; in every case he must beware of specifics.

A critic remarked that most examiners were convinced of the distemper's infectious character.<sup>30</sup> The legislature believed so, and the history of the disease bore out that belief; to propagate the contrary was mistaken and apt to prevent necessary measures. One might have expected, said he, that Barker would listen seriously to suffering farmers, Parliament, and his own medical brethren, but he had preferred to assail those who listened attentively to the "prejudices of farmers and cowkeepers." The writer himself believed that factors of air, soil, food, and management did not produce the murrain; nor did it generate spontaneously. It had grown milder as time passed. At first the medicines were ineffectual and the attacks so violent as to permit no relief. Then the symptoms moderated and bleeding was increasingly effective. For further improvement farmers should avoid infection and cheerfully abide by government orders, trust none of the celebrated

<sup>24</sup> *Gentleman's Magazine*, 16:649-650 (1746).

<sup>25</sup> *Ibid.*, 495-496; *London Magazine*, 15:470-471 (1746). For an index of over 150 ailments, including the murrain, wherein tar water was successful, see *Gentleman's Magazine*, 16:654 (1746).

<sup>26</sup> *Ibid.*, 630.

<sup>27</sup> *Ibid.*, 694, 698. For other samples of recipes, physicians' suggestions, laymen's advice, general news, and personal experiences, see *Scots Magazine*, 8:28-29, 66-70, 443 (1746).

<sup>28</sup> *Gentleman's Magazine*, 16:686-687 (1746).

<sup>29</sup> *Ibid.*, 17:17-18 (1747).

<sup>30</sup> *Ibid.*, 30-31.

remedies for these had proven ineffective and might indeed be injurious, and bleed plentifully, purge mildly, feed no dry meat but rather warm mash in small amounts, keep the cattle dry and warm, give no warm spicy drenches the first 4 or 5 days but warm water with vinegar and honey every 6 or 8 hours. A mixture of anise, cumin seed, and elecampane root in a pint of tar water was good as the disease abated.

Meanwhile, on January 5, 1747, Parliament continued, explained, and amended the statute of 1746, empowering the justices to order reasonable salaries to be paid to inspectors to prevent the spread of the distemper and defining other ways and means—primarily administrative rather than medical—of combatting it.<sup>31</sup> In the same month an order forbade the butchers of London, Westminster, and Southwark to kill calves, but this proved so great a hardship to breeders that it was soon repealed. A little later the King ordered:

1. That no Ox, Bull, Cow, Calf, Steer, or Heifer, whether fat or lean, shall pass the *Humber* or *Trent*, Northward, from the 19th Instant, to the 27th of *March* next; for which Purpose, the Justices are ordered to cause a strict Watch to be kept on all Bridges, Fords, &c. upon the said Rivers.

2. That where lean Cattle are put out to Pasture, and that not sufficient to supply them, the Owners may remove them to some other, tho' in a different Parish; but a Certificate must be first obtained, that they are in Health, agreeable to his Majesty's Order. . . .

3. That the Prohibition laid by his Majesty's aforesaid Order, with regard to the Removal and Sale of Calves, be taken off from all fatted Calves, provided they are free from any Distemper; Proof whereof must be made, pursuant to the aforesaid Order.

4. That in all Cases where Cattle are stopped . . . during the Examination of the Offenders, the Churchwardens are empower'd to put the said Cattle under the Care of a proper Person; and if it appears that the Cattle are such as are prohibited to be removed, and are not infected, then the Cattle shall be drove back the same Way from whence they were brought.

5. That instead of requiring the Oaths of two Constables, &c. to the Value of Cattle shot, and buried, . . . to entitle the Owners to the Reward; the Oath of one shall be sufficient where two can't be had; but the Owner must call a credible Witness, who is to make Oath, as is directed by the said Order to be made by the said Constables, &c. the Credibility of which Witness must be certified by the Churchwardens, &c. of the Parish where he is an Inhabitant.<sup>32</sup>

<sup>31</sup> 20 George II, c.4; *London Magazine*, 16:100 (1747); *Gentleman's Magazine*, 17:100 (1747).

<sup>32</sup> *London Magazine*, 16:50-51 (1747).

Later on, although the murrain had subsided in Middlesex, it still infested Derbyshire and Nottinghamshire, and an order in council while relaxing some rules enforced segregation.<sup>33</sup> This order was afterwards restated and included reference to compensation for owners whose cattle had been killed.<sup>34</sup> In September, the distemper having increased, the King prohibited throughout England the removal of any cattle from one town to another except such as were fatted and fit for immediate slaughter.

And for the greater Certainty that the fatted Cattle are not infected, no Person is to buy, sell, or offer to Sale, any such fatted Cattle, without delivering a Certificate, under the Hand and Seal of one or more Justices of the Peace for the County, Riding, Division, City, Liberty or Town Corporate, that the said Cattle and the Herd or Herds out of which the same were taken, were at that Time, and had been for the Space of two Months before the Date of such Certificate, entirely free from the said Distemper, and in the Possession of the Person selling the same. And for the better preventing the spreading of the said Distemper, by the Sale of lean Cattle, under the Pretence of their being fatted and ready for Slaughter, his Majesty orders that all Butchers, or others, who buy the said Cattle, shall cause them to be kill'd within the Space of ten Days from their being so bought. Which Order is to continue in Force for . . . three Calendar Months.<sup>35</sup>

Still another order required a certificate of health before a cow could be driven to the bull.<sup>36</sup>

Specifics and suggestions continued to match governmental regulation. One adherent of Barker's theory prescribed bleeding at the first cough and using the blood mixed with salt as a drench.<sup>37</sup> The cattle should be kept warm, dry, well-watered, and fed good sweet hay; a concoction of distilled wine or ale, pepper, gentian root, flour, mace, saffron, and cinnamon would halt "scouring." A second contributor recommended a quart of tar

<sup>33</sup> *Handlist*, 68; *Gentleman's Magazine*, 17:198 (1747). The order also forbade the holding of certain fairs.

<sup>34</sup> *Handlist*, 70; *Gentleman's Magazine*, 17:294 (1747).

<sup>35</sup> *London Magazine*, 16:435 (1747). See also *Gentleman's Magazine*, 17:445 (1747); *Handlist*, 70-71. This was renewed with variations on Dec. 11.

<sup>36</sup> *Gentleman's Magazine*, 17:591 (1747). On Oct. 27, 1747, one order sought to prevent abuses in claiming compensation for cattle slaughtered on account of the distemper, and another allowed certain droves to be disposed of under specific restrictions. *Handlist*, 71.

<sup>37</sup> *Gentleman's Magazine*, 17:18 (1747).

water, given till the beast recovered, and warned: "don't let her go too soon abroad."<sup>38</sup> A third believed that a gallon of tar would persevere a cow.<sup>39</sup> Berkeley himself, in praising his own specific, thought that although people might be loath to experiment on themselves they would willingly attempt so inexpensive a remedy on their cattle.<sup>40</sup>

According to a Swedish report the epidemic became contagious only by neglect and could be discovered by examining the tongue. If no inflammation was found near the roots, where the distemper always began, the animals were sound, in which case rubbing their tongues for several days with tar or wheel grease would be a sure preservative.<sup>41</sup> If signs were bad, burnt and powdered alum with an equal quantity of salt should be rubbed on the ulcers which then should be washed with wine for 3 or 4 days. "During this Operation give them every Morning half an Ounce of Linseed, and half an Ounce of Sallad Oil, fasting.—Their Common Drink should be warm Water, with a little Flour in it." Another writer recommended opening the pimples, injecting a bit of inner cassia or wild currant bark, and squeezing out the corrupt matter. He also advised fumigating the stables with camphor, asafetida, and garlic in live coals with juniper berries, which decoction should be breathed by the cattle.<sup>42</sup> A Norwich correspondent reported hundreds of surprising cures by blowing the cow's nostrils "as much snuff (made of asarum leaves dried, and beat to a fine powder) as would lie on a shilling . . . which would in a few hours cause a matter to run in large quantities from the said beast, and thereby prevent its settling on the lungs." No sound cattle thus treated had taken the infection. The rumors of deliberate spreading of the distemper were untrue.<sup>43</sup>

<sup>38</sup> *Ibid.*, 22.

<sup>39</sup> *Ibid.*, 64–65.

<sup>40</sup> *London Magazine*, 16:127–128 (1747). In his recipe Berkeley listed the various diseases for which tar water had proven effective. He also praised its efficacy in curing the plague. *Ibid.*, 443–446. See also Burton Chance, "Bishop Berkeley and His Use of Tar-Water," *Annals of Medical History* (ser. 3), 4:462 (1942).

<sup>41</sup> *London Magazine*, 16:88 (1747). Similarly an English correspondent warned that if any pimple were found in the cow's mouth she should be put in a warm dry place and given tar water four times a day. *Gentleman's Magazine*, 17:22 (1747).

<sup>42</sup> *Ibid.*, 153.

<sup>43</sup> *Ibid.*, 74–75; *London Magazine*, 16:99 (1747).

Early in 1747 someone suggested the application of electricity. The projection of a tube into the anus, it was argued, would permit the propagation of electric vapor through the whole intestinal tract, and conversely projection into the mouth and thorax would affect the entire digestive and respiratory systems, all with the most beneficial consequences.<sup>44</sup> No such experiment, however, seems to have been attempted. Another author traced the murrain to invisible animalcula in the air. Their smallness constituted no objection, for according to some people there were three billion in masculine seed. Fumigation, especially fire, was therefore the best remedy. Bleeding was highly dubious and purges must be cautiously used. On the other hand, Peruvian bark was beneficial.<sup>45</sup>

More conventionally, one observer described the epidemic as a lung fever not unlike those besetting mankind. Drawing an analogy between human and animal diseases he believed the distemper not infectious because of its simultaneous appearance in many places. Bleeding, bran mash, warmth, dryness, tar water, and herbs were appropriate remedies.<sup>46</sup> A Nottingham justice submitted a specific tried on hundreds of cattle and found almost infallible if administered before infection. Angelica roots (butterbur roots could be substituted) and rue chopped small were boiled in water; after straining the liquid "put an equal quantity of vinegar to it, and an ounce of anniseeds pounded fine. Give a pint of this liquor every morning fasting, a pint at noon, and another at night, for three days successively; bleed your beast the second morning, taking two quarts if the beast be able to bear it."<sup>47</sup> Lincolnshire, where the murrain was virulent, contributed two cures.<sup>48</sup> In one case, an elaborate ritual of bleeding and rowelling was followed by a thin mash of warm water, licorice, honey, and saltpeter. The other recipe, to be left by drovers in every town through which they passed, contained wild carrot, angelica root, fennel

<sup>44</sup> *London Magazine*, 16:135–136 (1747).

<sup>45</sup> *Gentleman's Magazine*, 17:480–481, 599–600 (1747).

<sup>46</sup> *Ibid.*, 218–220.

<sup>47</sup> *Ibid.*, 408–409; *London Magazine*, 16:386–387 (1747). See also the recipe whose author, perhaps the same "J.S." noted above, confirmed its success, calling for coriander, anise, cumin, caraway seeds in water, and likewise bleeding, poultices, warmth, and dryness.

<sup>48</sup> *London Magazine*, 16:579 (1747). For other items, see *Scots Magazine*, 9:46, 49, 89–90, 452 (1747); *Universal Magazine*, 1:78, 147, 175, 224 (London, 1747). *Ibid.*, 368, carried an abstract of Wincler's article mentioned above in note 3.



seed, groundsel, missel, cassia, and eryngo, boiled in spring water. Some of this liquid was to be given the beast through the nostrils at drinking time; the remainder, thickened with meal, and with myrrh and frankincense added, was to be fed the animal three times a day for 3 days. If the need arose Glauber's salts might be added.

Not only did the epidemic stimulate governmental action and medical suggestions, but it even inspired "A Pastoral" wherein Diggon, burying his favorite cow when neighbor Colin came by, lamented:

Diggon.

How could I hope, where such contagion reigns,  
Where one wide ruin sweeps the desert plains,  
Where ev'ry gale contains the seeds of death,  
That Diggon's kine should draw untainted breath?

\* \* \* \*

Colin.

But have you, Diggon, all those methods try'd,  
By book-learn'd doctors taught, when cattle dy'd?  
Or, tho' no doctor's remedies prevail,  
Does the good bishop's fam'd Tar-water fail?

Diggon.

Each art I try'd, did all that man could do;  
Med'cines I gave, like poison, med'cines slew:  
The bishop' drink, which snatch'd me from the  
grave,  
Giv'n to my cow, forgot its pow'r to save.

\* \* \* \*

Dejected first she hung her drooping head,  
Refus'd her meat, and from her pasture fled;  
Then dead and languid seem'd her plaintive eye,  
Her breath grew noisome, and her udder dry.

\* \* \* \*

Scorch'd with perpetual thirst, short sighs she drew,  
Furr'd was her tongue, and to her mouth it grew:  
Her burning nostrils putrid rheums distill'd,  
And death's strong agonies her bowels fill'd;  
Each limb contracted, and a groan each breath,  
Lost ease I wish'd her, and it came in death.<sup>49</sup>

\* \* \* \*

Through 1748 governmental policies continued unchanged but not unchallenged.<sup>50</sup> "A Farmer" criticized the payment of £100,000 to sufferers and the proposed reward for a remedy as in vain until

<sup>49</sup> *Gentleman's Magazine*, 17:443 (1747).

<sup>50</sup> 21 George II, c.33; *London Magazine*, 17:41 (1748); *Handlist*, 71, 72.

better regulation of buying and selling was enforced. Since perverse men mixed sick and well cattle he marveled that the mortality had not been greater. As cures he recommended bleeding, blistering, tar water, warm bran water, cleanliness, and fumigation.<sup>51</sup>

Other communications reported that dogs as well as cowherds carried the infection. One farmer, whose cattle were among the last to be attacked in his vicinity, found a mixture of treacle, brandy, and beer effective. When he administered tar water his cattle died; when he omitted it they lived.<sup>52</sup> Some of his neighbors had the same experience. Another farmer having lost several cows used Jesuit bark in warm water; finding the victims improved he alternated between red wine and the bark, and they survived.<sup>53</sup> By contrast in another instance the bark and wine had proven inadequate, but bark and butter dock were effective; and it was suggested that the dock alone might do.<sup>54</sup> When fumigation with soot failed one correspondent tried bark and cinnamon water successfully; a second swore by bleeding and bark and cinnamon water; a third first bled his cattle, then mixed oak and burdock roots with ale and served the liquor hot, following this with milk pottage and the best hay in small quantities.<sup>55</sup> Late in April 1748, a Lincolnshire justice reported that up to the seventh of that month 1,651 cattle had died within a small area, besides great numbers since. A schoolmaster with three cows had fixed quicksilver girdles about the neck of each, and all had survived.<sup>56</sup>

More significant were essays relating how the distemper had been propagated and giving hints for preventing it.<sup>57</sup> One writer, who traced the

<sup>51</sup> *Gentleman's Magazine*, 18:166-167 (1748).

<sup>52</sup> *Ibid.*, 283; *London Magazine*, 17:248 (1748).

<sup>53</sup> *Gentleman's Magazine*, 18:455 (1748); *London Magazine*, 17:474 (1748).

<sup>54</sup> *Gentleman's Magazine*, 18:560 (1748).

<sup>55</sup> *Ibid.*, 455, 535; *London Magazine*, 17:475 (1748).

<sup>56</sup> *Ibid.*, 233. See also *Scots Magazine*, 10:454 (1748); and *Universal Magazine*, 2:279 (1748); 3:35, 83 (1748), for similar recipes.

<sup>57</sup> *London Magazine*, 17:120-121 (1748). All through 1747 and 1748 a number of tractates, generally comparable to those already noted, analyzed the murrain. Reference may be especially made to the following: Key, *A Compleat View of the Present Epidemical Distemper among the Horned Cattle* (1747); *A General System, or, Summary Method of Cure for the Epidemical Distemper among the Horned Cattle* (1747); *An Essay*

murrain from Africa through Europe into Great Britain, believed that the disease was carried in the clothing of all who in any way came in contact with cattle. Consequently no one should "go near the Cattle but those who fodder and milk them, and let these People never go to them in the same Cloaths they go to Fairs and Markets in," but let each have a special frock, hat, and even wig "else tuck all their Hair up under a Linen Cap made for that Purpose." For prevention, bleed all the cattle, and put a rowel under their bellies, and boil rue, sage, and wormwood in water; after straining it give each beast a pint and a half three times a week and either rub their noses with tar or syringe their noses and mouths every morning with tar water. By this method, and by bleeding and segregation, a certain nobleman had preserved his herd.

In Yorkshire, to secure better cooperation with governmental policy, 32 landlords promised their tenants an additional 10 shillings for every 20 shillings from the King for killing their cows, as well as assistance in making their claims.<sup>58</sup> The editor's hope that others would imitate such an honorable precedent had at least partial fulfilment in Durham where the gentry supplemented the government award.<sup>59</sup>

Among cures one was credited with having been very successfully used by a Derby farmer, 22 of whose cows died before he used it, the other 11 recovering by it.<sup>60</sup> When his cattle were first

seized, even though they would eat they lost their cuds. Thereupon he shut them up and gave them a little rye paste which caused them to chew their cuds. He then gave them nothing but water to drink till he perceived that they grew worse, after which he boiled colocynth and herb grace or garden rue, in water, added sweet oil, and gave it to each beast; in 12 hours he administered the oil alone and then only water gruel to drink until the beast was nearly recovered. Another writer emphasized the smallpox analogy, and since the Americans had used tar water to cure consumptions and to prevent smallpox, he (as the beast would not drink a sufficient quantity of the infusion) advised giving the tar itself. Wrought to a due stiffness with barley flour, oatmeal, or bran, a ball or two might be given night and morning for a week. He was also of the opinion that all infectious diseases were "caused by oviparous Animalcula; and then Tar must be an actual Poison to the imperceptible Vermin, and so, by killing them, cure, or prevent, the Distempers they occasion."<sup>61</sup>

A more novel suggestion came from "Mulo-Medicus" who praised the experiment of injecting some particular liquor into the cow's blood.

... nothing can be done with greater ease, or at a smaller expence. The manner of performing it may be thus. Take half an ounce of salt-petre, and half a quarter of an ounce of tobacco: Boil them a minute or two in half a pint of water, and let the strain'd liquor be injected, blood-warm, into the neck-vein, with a syringe or glyster-pipe, directing the point of the instrument, along with the current of the blood, towards the heart, as soon as a quart or two of blood has been taken away at a large orifice; which let then be pinn'd up as usual. I cannot foresee any ill consequences attending this experiment: It may probably occasion some slight convulsions, and afterwards a profuse sweat, or some other evacuations; by which the beast will be freed from its disorder. It will also be one way of proving, whether the doctrine of animalcula be true or false; for, if true, this bids fair for their destruction.<sup>62</sup>

Of recipes, one prescribed fresh madder, tobacco, pigeon's dung, brownwort, and similar ingredients boiled in stale urine; vinegar, asafetida, and urine should be boiled and put into the nostrils, and tar, sulphur, and garlic rubbed on the nose. Ale and salad oil and bleeding were also recommended.<sup>63</sup> A Dutch remedy substituted straw for

on the Nature and Cure of the Distemper among the Cattle (1747); [William Dodd], a divine (1729-77), *A Pastoral on the Distemper among the Horned Cattle* (1747); *Distemper among the Cattle* (1747), a sermon on Exodus, 9:3; *An Essay Occasion'd by the Contagious Distemper Still Raging among the Cattle in Many Parts of This Kingdom . . .* (1748). This received prominent attention in the *Monthly Review*, 1:320 (1749). [Richard Davies], *An Essay concerning Pestilential Contagion, Occasion'd by the Distemper Now Raging among the Cattle, with a Method Proposed to Prevent Its Progress* (1748, 1757); *An Essay on the Contagious Distemper among the Cattle* (1748); *An Essay To Fix the Judgment of the Public on the Nature and Cure of the Distemper Now Raging among the Horned Cattle* (1748?); *An Essay Occasioned by the Distemper of the Cattle, Shewing, Probably, the Cause of Its Continuance in This Kingdom . . .* (ed. 2, n. d.). Some of these may be re-issues and new editions of the same tract.

<sup>58</sup> *London Magazine*, 17:175 (1748).

<sup>59</sup> *Gentleman's Magazine*, 19:427 (1749).

<sup>60</sup> *London Magazine*, 17:41-42 (1748).

<sup>61</sup> *Ibid.*, 152.

<sup>62</sup> *Ibid.*, 516.

<sup>63</sup> *Gentleman's Magazine*, 19:8 (1749).

hay in feeding; the cattle should also have warm rhubarb water, and then honey, carrots, oil, and red wine. Their backs should be rubbed with buttermilk and their nostrils with vinegar. Warmth and dryness were essential.<sup>64</sup> A third recipe called for an oil and gruel diet. A fourth, in addition to dryness and warmth, prescribed human urine, the older the better, and hen's dung, steeped 10 hours. If this did no good, wait a day or two, and feed it again fasting. A light liquid diet, but no water, and bleeding, were approved.<sup>65</sup> A fifth, successful in Barbados, was rum punch, 1 to 3 half pints in proportion to the size. One correspondent would feed the beast gin and verjuice in warm water, following this, as the animal started recovery, with bole ammoniac, burnt cork, and gin water gruel.<sup>66</sup> A second preferred boiling bruised cloves of garlic with rue, nettles, and "gill-run-by-ground" in crab verjuice, with turpentine added when cool. This should be given as soon as the cow began to dry up, a certain symptom of the distemper; it had also answered when the murrain was well advanced. Another praised a combination of Barbados tar and mercury, rubbed together till the latter disappeared, with finely pounded niter, roche alum, and nutmeg, and enough Armenian bole to make the whole into eight balls, one to be administered each morning and evening, for prevention or cure. Let the diet be turnip mash. "Laying all hypothesis and philosophizing aside, the honest unfortunate farmer is earnestly advised to try the foregoing, and he will not repent his labour."<sup>67</sup>

A French experimenter believed the distemper a kind of smallpox, communicated only by one cow to another.<sup>68</sup> He had tried many tests without definitive results, but, *inter alia*, he noted that a person could safely eat the flesh of diseased cows, since calves suckled them without injury, and a sound cow ate the blood of a diseased animal on her fodder without effect. One writer pooh-poohed fumigation. Another thought that cor-

rosive salts generated in the air and infected cattle.<sup>69</sup> He was attacked on the ground that he should explain his terms and discover whether or not he had confused some bodily organs with others. Concerned only with the public good this critic regretted that the task of combatting the distemper had fallen to those unequal to it; in consequence empty conjectures filled the air.<sup>70</sup> The murrain was also explained in terms of the inert glutinousness of the blood which brought on inflammatory fever and halted circulation. This condition resulted from some fault in the air or the food and was anticipated by a cough. Post-mortems had clearly shown the harmful effects on the lungs and liver.<sup>71</sup>

More comprehensively one author would base all observations on daily experience which was "preferable to all theories and systems whatever." He especially disliked the "academic school-physician" who clothed his ignorance in jargon, and he went out of his way to criticize Lobb and Mortimer.<sup>72</sup> Physicians should be appointed for each county to observe and inquire into the cause and state of the plague, even though they could not possibly examine all suggested remedies. Charging some writers with assuming on no evidence that the present distemper was similar to that of 1714, he regarded it as an inflammatory fever resulting from poor circulation. Unlike most writers he had a wide acquaintance with the literature of the subject and quoted the fourth-century treatise on the diseases of oxen by Publius Vegetius Renatus in favor of warmth and dryness for such distempers as this. The obvious symptoms were dullness, shivering, lethargy, and coughing. He opposed harsh purges and recommended bleeding, currying, cleanliness, and blistering, but no dry food. Milking should be continued if only in a small quantity.

Contemporaneously with these prescriptions the government continued its oversight through statutes and orders. Because tanners had spread the distemper by buying the hides of infected beasts, an act of 1749 required them, before bringing hides to the tanyard, to produce a proper certificate specifying the color of the hide, the name and residence of the owner, and the freedom of the beast

<sup>64</sup> *Ibid.*, 91-92.

<sup>65</sup> *Ibid.*, 102.

<sup>66</sup> *Ibid.*, 389, 459.

<sup>67</sup> *London Magazine*, 18:432, 436 (1749). See also *Universal Magazine*, 4:77 (1749), where a regimen of rhubarb water, oil, and honey, currying, and warmth, but no hay, is recommended; and *ibid.*, 5:189-190 (1749), for other recipes.

<sup>68</sup> *Gentleman's Magazine*, 19:19-20 (1749). The Frenchman here referred to was the physician, Marquis de Courtrivon (1715-85).

<sup>69</sup> *Ibid.*, 150-151.

<sup>70</sup> *Ibid.*, 267-268. This essay excited a totally inadequate reply in *ibid.*, 457.

<sup>71</sup> *Ibid.*, 458-459.

<sup>72</sup> *Ibid.*, 490-495. See also Fleming, *Animal Plagues*, 1:290-296.

from infection, on pain of forfeiting £10. Excise officers could enter tanyards to search for hides brought in contrary to law; obstructions to this action carried a penalty of £10. The King could forbid the killing of any cow calves in order to encourage the breeding of cattle, and any offender forfeited 40 shillings. To prevent the spread of the distemper by dealers who bought up infected cattle and sold them in healthy places, no one should sell any animals in less than 40 days of ownership, and he must present a certificate signifying the date of purchase; offenders were to pay a £10 fine for each beast criminally sold. False certificates carried the same penalty. Drovers whose cattle sickened on the road should notify the proper officials in order that the beast might be slain and buried, the skin being slashed if the animal was distempered. Offending drovers were penalized £10 or imprisoned 6 months. The King's orders in council had the same authority as parliamentary enactments, and were to be observed under penalty of £10. Any person obstructing their administration would forfeit £50, provided the action be brought within 6 months and in the same county where the offense was charged.<sup>73</sup>

Additional orders implemented this statute.<sup>74</sup> In December 1749, the King ruled:

... after Jan. 14, and before March 14, no ox, bull, cow, calf, steer, or heifer, within England, ... be removed from the grounds, lands or places where they shall be on the said 14th of Jan. excepting only such sound and fat cattle, fit for slaughter, as shall be removed to be slaughtered at some uninfected place within two miles from where they shall be on Jan. 14. But it is not intended to prohibit the carriage of carcasses of cattle not infected, without their hides, to such places, and in such manner, as the respective owners thereof shall think fit; nor to prohibit the removal of such cattle, as shall be in want of pasture, into other grounds belonging to the owner of such cattle, not above the distance of two miles from the places where the same shall be on the said 14th of Jan. nor within one mile of any infected place. Nor is it intended by this order, to prohibit the removal of any such cattle, which shall be within the dominion of Wales, from one part of the said dominion to any other; nor such cattle which shall

be in any of the counties of Somerset, Dorset, Devon, and Cornwall, from one place to another within the said counties, but without going into any other, which are all represented to be, not only free from the said infection, but at a considerable distance from the infected parts of this kingdom.

This order, inspired by ineffective policies, the violence of the distemper, and fraudulent certificates, was repealed a month later when men complained that it would greatly inconvenience many parts of the kingdom. Conditions were restored as of March 22, 1747, until further notice. Owners of infected animals, however, should notify the proper authorities.

In connection with the basic assumptions of governmental policy, *Considerations Concerning the Distemper Which Still Spreads Itself among the Horned Cattle in This Kingdom* (London, 1749), by a physician, argued that nothing contributed so much to the strength of the distemper as the conviction that it was not contagious. The author was familiar with Ramazzini's work and with many other studies in pathology. He believed that the murrain in England strikingly resembled that which Ramazzini had described: stupidity, flux, shortness of breath, eruptions, coagulation of the blood, and death occurring between the fifth and seventh days. Interestingly enough this writer recognized the existence of "carriers" who remained uninfected in the midst of the contagion. Prompt killing alone was effective.<sup>75</sup>

The 40-shilling compensation for killing infected cattle also aroused discussion.<sup>76</sup> A farmer with 39 cows of £5 value each, a total of £195, received on killing them £78, which represented a loss of £117 plus the charge of £7 16s. for burying them. If the murrain took its course he would probably salvage 13 worth £65. He would therefore prefer to kill none, hoping to save more, and the survivors would be immune for the future; new stock would not be. He might indeed find it more profitable to disregard the order. Even if the farmer killed his afflicted stock he could not get hands to bury them. If the premium were raised, fraud would flourish, for already men had killed worthless cattle and collected the 40 shillings. All traffic ought to be stopped, but animals from Scotland, Ireland, and Wales were freely entering. Some measures now in force ought to have been put into effect

<sup>73</sup> 22 George II, c.46.

<sup>74</sup> *London Magazine*, 18:576 (1749). See also *ibid.*, 19:43 (1750); *Gentleman's Magazine*, 19:294-295, 561-562 (1749); 20:21-22 (1750); *Handlist*, 75. The act of 23 George II, c.23 (1750) continued the several laws for checking the distemper, as did 24 George II, c.54 (1751) and 25 George II, c.31 (1752).

<sup>75</sup> Fleming, *Animal Plagues*, 1:290-296.

<sup>76</sup> *Gentleman's Magazine*, 20:22-24 (1750).



earlier, and care should be taken to prevent the evasion of troublesome orders.

This statement immediately aroused "Agricola" who feared lest misinformation inspire mistaken action.<sup>77</sup> No matter how good his intentions, the above author in misrepresenting the facts would prejudice the farmers against regulation. Agricola calculated that on the average about 1 in 6 or 7 beasts recovered. If the infected cattle were killed in time, the litter immediately buried, and their keepers kept from the sound animals, the distemper, which flourished most where care was least, would stop. From available figures he assumed the value of cows to average about £3 10s. Suppose, however, a farmer had 40 cows at £4, and had to kill 10 to stop the infection. He received a premium of £20, and with his 30 sound head he had a total of £140 minus £2 for burying the dead, which left him £138, a loss of £22. If, on the other hand, he saved 8 by letting the distemper run its course, he lost by death and burial expenses, £136 16s. as opposed to £22.

Agricola also requested his opponent to show: (1) that a distempered cow had no value; (2) how, since it did not happen elsewhere, the distemper would wear out in England without regulations; (3) whether the premium was not adequate reparation; (4) if it necessarily followed that the present rules were bad even though the distemper had expanded; (5) whether, if not, the government should supersede or enforce them; (6) why, if killing infected beasts was all right in the days of Vergil, it was not so now; (7) whether a farmer who decided not to kill should be permitted to disregard society; (8) if a farm could be sooner restocked where the cattle were killed promptly or where they languished and died; (9) since infected cows cast their calves what value a recovered cow had to a dairy; (10) whether present loss was not preferable to protracted drain; (11) if he had met with cows attacked a second time and whether they had recovered. In conclusion Agricola strongly recommended *The Case of Killing Infected Beasts Briefly Considered*, by R. Whitworth.

Another contributor also praised this tract, the more since some people were teaching that the distemper proceeded from animalcula and not from infection. Of these people he inquired if it were not dangerous to leave the animalcula undisturbed. The law should be enforced especially since a conscientious justice had recently discovered that

some villainous drovers either had no certificates or only forged ones.<sup>78</sup>

Complying with the suggestions, the editor of the *Gentleman's Magazine* printed the substance of Whitworth's tract. Where mortality had been heavy, according to this author, grass rotted for want of mouths, hay could not be sold, and the noxious effluvia remained in the stall if not in the pasture. Unfortunately, men put too much faith in medicines and did not immediately kill their distempered beasts. In one parish where government measures were applied, 4 or 5 herds were seized but the distemper passed in 6 weeks and only 9 or 10 animals died. Where men killed their cattle the loss was slight; otherwise they seldom saved 1 in 10. Whitworth then laid down several propositions: the distemper is infectious; cattle should be killed as soon as infected; no cure has been found though many have been tried; cows are not doubled in value by recovery; the law which requires killing and burial within 24 hours is agreeable to the Magna Carta and the British Constitution; all laws are to be obeyed though some are unpopular; while the cattle belong to individuals the government may equitably order their killing for the public good; the distemper is not a divine judgment and men should combat it in every way possible. He concluded by recalling that Vergil and Columella had recommended the slaughter of infected cattle and that such a policy had proven efficacious in 1714.<sup>79</sup>

The writer, "Philo-Boas," regretted that fashionable doctors feared to visit a cow lest they incur "the filthy appellation of cow-leech." Fortunately, however, the profession had many public-spirited members.<sup>80</sup> Therefore opportunities for experiment should be provided; in each county where cattle were ill let a place, properly restricted, be appointed as a hospital where animals were placed on the payment of 40 shillings by the government. For every beast that recovered let the owner pay 20 or 40 shillings. The dead cattle should be inspected by the doctors who would publish a report. One great anatomist thought the distemper located entirely in the lungs which ex-

<sup>78</sup> *Ibid.*, 489.

<sup>79</sup> *Ibid.*, 489-492. At least three other tracts appeared in 1750: *An Essay on the Distemper amongst the Cattle*; Litton, *The Theory of the Distemper amongst the Horned Cattle, and Electrical Medicines Proposed*; and S. King, *A Sermon on the Mortality among the Cattle*.

<sup>80</sup> *Gentleman's Magazine*, 20:173-174 (1750).

<sup>77</sup> *Ibid.*, 105-106.

plained the difficulty in breathing. Unless such hypotheses were tested and drastic action taken, the murrain would end only with the last cow.

Recipes of course were plentiful. A grazier found asafetida, garlic, and rue, made into a ball the size of a walnut and placed in each ear until dissolved, effective.<sup>81</sup> The treatment might be repeated. Another writer recommended that cattle be allowed to graze only for an hour or two. "To keep the maw as empty as is consistent with the health and strength of the beast, by taking them up frequently from their pasture or food, seems to be one likely method to prevent them from suffering so much as otherwise they might do, should they be infected."<sup>82</sup> One man described the horn of a dead distempered cow as hollow with the pithy matter decayed. He had had a hole bored in the horns of two ill cattle close to the head. Much matter emerged and brought relief; the cows recovered. Although another farmer tried this experiment on sheep with beneficial effect, a second had found it totally ineffective on large herds of cows.<sup>83</sup>

To refute the charges of physicians' indifference Dr. John Wall of Worcester turned to the distemper.<sup>84</sup> He believed that the disease continued

not through incurability but through wrong treatment. The parts first affected were the glands about the throat, then the lungs, and finally the bowels. This closely resembled sore throat in human beings, in whom strength must be kept up and perspiration procured. The same regimen ought to be given cattle: warmth, cleanliness, liquid diet, and a drench of myrrh, vinegar, and Jesuit bark. If the victim was far gone, add wine or brandy and cascarilla. Where the disease was violent all ill beasts should be put in a pesthouse under a doctor's care and the symptoms fully described so that the treatments might be improved.

Inspired by Wall one writer described an earlier epidemic of ulcerous sore throats in New England. At first the quacks had fruitlessly bled and purged; then people turned to the sort of treatment prescribed by Wall and recovered. Another writer praised the pesthouse idea and denounced some rules on the sale of cattle as devoid of sense.<sup>85</sup> Although men were quick to point out the inefficacy of many "cures" specifics abounded and thus illustrated the continuing mortality.<sup>86</sup> Its outbreak near London brought the recommendation of certain powders and general advice about warmth. Early in 1752 a threat in Somerset aroused the justices who ordered all infected bullocks to be killed and buried 7 or 8 feet deep. They also bought all cattle that herded with the diseased and had them shot and buried. In 1753 the distemper was active in Wiltshire where 15 animals were ordered shot, and the justices prohibited fairs and markets. Elsewhere a farmer was convicted

<sup>81</sup> *Gentleman's Magazine*, 106-107.

<sup>82</sup> *London Magazine*, 19:368 (1750).

<sup>83</sup> *Gentleman's Magazine*, 20:525 (1750); 21:41 (1751); *Scots Magazine*, 13:107-108 (1751).

<sup>84</sup> *Gentleman's Magazine*, 21:71-72 (1751). Dr. John Wall (1708-76), author of "Thoughts upon the Distemper amongst the Horned Cattle, with a Method of Cure Proposed," was a distinguished Worcester physician of wide interests. He studied fevers, smallpox, balneotherapy, and sore throat; and in this latter connection was the first to point out the resemblance between sore throat in man and the foot and mouth disease in cattle. He was also a pediatrician, prescribing olive oil for worms in children. In his own day he had considerable reputation as a painter. Several other pamphlets appeared in 1751. A "Physician" explained the whole matter by "pollution in the air" and deplored the destruction of cattle through failure to follow rational means of cure in *A Treatise on the Plague and Pestilential Fevers, with Some Useful Hints for the Better Prevention and Cure, together with some Observations on the Pestilential Fever Now Raging among the Horned Cattle*. There were likewise: *Observations upon the Distemper of the Horned Cattle*; *Britain's Alarm, from the Continuance of the Contagion among the Cattle, and Other More Afflicting and Important Evils Threatning and Befalling Us*; *A Col-*

*lection of All the Orders of Council concerning Distemper'd Cattle*; and Blondet, *Dissertation on the Epidemical Distemper among the Horned Cattle*, a translation of *Dissertation sur la maladie épidémique des bestiaux* (1748).

<sup>85</sup> *Gentleman's Magazine*, 21:114-115, 125-126 (1751).

<sup>86</sup> *Ibid.*, 235, 376, 476; 22:176, 190 (1752). From Charleston, South Carolina, came a report that the distemper which had broken out in 1742 was declining. Various remedies had been tried but none proved effectual and the infected beasts generally died within 6 hours. The loss had been very great. *Ibid.*, 21:39 (1751). Evidence of the distemper's persistence appears in the *Scots Magazine*, 12:46-47 (1750); 13:500 (1751); and in the proclamation of Aug. 9, 1751, against holding any fair likely to spread the distemper. *Handlist*, 77.

of selling infected cattle and resisting officials.<sup>87</sup> No wonder that in November, Parliament, in considering means to prevent the distemper's spread, continued the earlier legislation virtually without change.<sup>88</sup>

A Yorkshire farmer's experience with inoculation was reported thus:

<sup>87</sup> *London Magazine*, 22:533 (1753); *Gentleman's Magazine*, 23:197, 489, 490, 537 (1753). *A Probable Scheme for Putting a Final Stop to the Distemper among the Horned Cattle, and Preventing the Ruin of Farmers while It Continues; in a Letter to a Member of Parliament appeared in 1753; as did Dr. William Hird, Remarks upon Pestilence and Pestilential Diseases, Interspersed with Some Observations on the Mortality amongst the Horned Cattle, wherein This Heavy Calamity, both from Reason and Analogy, Is Set in a New and Clear Light, and Certain Easy Means of Preservation and Cure Are Recommended upon Rational and Experimental Principles*; and ed. 2 of *Britain's Alarm* (ed. 1, 1751).

<sup>88</sup> 26 George II, c.34; *London Magazine*, 23:316-317 (1754). The statute was continued in 27 George II, c.14 (1754). According to Fleming, *Animal Plagues*, 1:287-289, the murrain received much attention from the Commons in 1753-54 and the "motion to consider" produced a series of resolutions which were not published until 1866. Although agreed to by the House, with the amendments included in brackets, the bill founded on them and passed by the Commons was rejected in committee by the Lords "perhaps in consequence of the approaching dissolution of Parliament, and a simple Continuance Bill was passed instead." The resolutions were: "1. The lodging of cattle driven for sale in places where infected cattle are or have lately been, may be one cause of spreading the distemper. 2. The mixing together different herds of cattle not fit for immediate slaughter in fairs, markets, and other places for sale has been one other cause. 3. The mixing of infected cattle with sound on commons and common grounds has been one other cause. 4. Great difficulties and inconveniences have arisen and may hereafter arise from the want of proper powers to order the lodging cattle stopped by virtue of his Majesty's Orders in Council of March 22, 1747-8. 5. The laws, rules, orders, and regulations for the killing of infected cattle upon their first being seized have not in general been punctually complied with. 6. Certificates for cattle to be driven beyond the distance of five miles, without a limitation of time beyond which such certificates shall cease to be of force, are subject to abuse, and may have been one other cause. 7. All contracts and bargains between the buyers and sellers of cattle, conditional upon such cattle, or any number of them, surviving a certain time, tend to the continuing and further spreading of the distemper. 8.

Sir William St. Quintin, of Scampston, in Yorkshire, lately inoculated 8 calves, seven of which had the distemper from the inoculation, and recovered, and were afterwards turned into a herd of infected cattle, without being infected a second time. An old ox was also inoc-

The laws, rules, orders, and regulations now in being should be reduced into one Act of Parliament, subject to such alterations and regulations as his Majesty, by the advice of his Privy Council, shall from time to time think proper to order. 9. The notices ordered to be given of the breaking out and arising in particular places of the distemper by his Majesty's Order in Council of the 22nd day of March, 1747-8, should be published in the *London Gazette*. 10. No horned cattle should be driven or admitted into any pasture, close, or field where the distemper has been for two calendar months after such distemper has ceased, nor for six calendar months where such pastures, closes, or fields have not been cleared of all litter, dung, stones, or hay, and where such pastures, &c., have not been rolled, mowed, or fed bare with horses, hogs, geese, or sheep. 11. No certificates for cattle to be driven beyond the distance of five miles, conformable to his Majesty's Order in Council, should be of force for any longer term than ten days from the date of such certificate. 12. No two or more herds of cattle, consisting together of above 20 beasts, intended for immediate sale, and not fit for immediate slaughter, should be driven or admitted at the same time in the same pasture, close, field, fair, market-place, or other place of sale whatsoever, unless such pasture, &c., be so separated and divided as to preserve the cattle of such different herds from immediate contact. 13. No horned cattle should be driven to pasture in common or common grounds unless such cattle have been in the possession of their owners and free from the distemper 40 days at the least before such driving. 14. Proper powers should be granted for the lodging [disposition] such cattle as shall be stopped by virtue of his Majesty's Order in Council, dated March 22, 1747-8. 15. All contracts and bargains between the buyers and sellers of cattle, conditional upon such cattle, or any number of them, surviving a certain time, should be void, and further penalties be inflicted upon all those who shall so offend. 16. Reward equal to the full value should be paid to the owner of every first, second, and third beast of the whole stock of horned cattle upon every farm or holding [or upon commons thereto belonging] of the same person, that shall be seized with the distemper, and that shall be separated, killed, and buried conformable to his Majesty's Order in Council of March 22, 1747-8, provided such beast or beasts shall have been the real property and remained in the actual possession of such owner 40 days at the least immediately preceding such killing."



ulated at Malton, which had the distemper from inoculation, and recovered, and was afterwards turned into a herd of infected cattle, and continued in the pasture with them till they were all dead; and was then turned into another herd of infected cattle, but did not receive the infection a second time.

Each beast was first bled and kept from all dry feed till he quite recovered. To keep his body open he was fed scalded bran. At the end of 3 days a piece of tow dipped in morbid matter from the nostrils of an infected beast was put in the dewlap. The wound was then stitched up and the tow allowed to remain till the symptoms of the distemper appeared, when it was removed. The beast was then turned out to grass; until the crisis passed he had no dry food, but now and then a warm mash. The experiment had saved 9 out of 10 in one herd.<sup>89</sup>

In contrast an experiment in Holland failed. The first test promised well as the beast survived in the midst of death. Encouraged, a man inoculated 17 beasts but only 3 survived, 1 of these survivors had had the distemper but was strongly affected by inoculation. However, another owner was ready to try again, and would avoid what might have caused the failure of the first experiment, namely, putting all 17 together.<sup>90</sup> Supplementing this account, a professor of surgery at The Hague described his poor success in inoculating cattle in the manner directed. Afterwards, he inoculated the rumps of the animals with infectious matter and followed this with Epsom salts as soon as hard excrements had been voided. In 2 weeks the cattle had fully recovered.<sup>91</sup>

Meanwhile other items came to light. One writer desired the more effectual enforcement of the statutes; he also wished that all the medicines could be collected and sold at an "easy price" and that the legislature would encourage eminent physicians to discover a cure.<sup>92</sup> A farmer recom-

mended warmth, blistering, and a concoction of rosemary, rue, lavender, treacle, madder, diascordium, and verjuice, as well as a moderate diet; he advised bleeding only in case of much inflammation. The physician to Empress Anne of Russia prescribed bitter herbs and no food, yeast in the drink, a pill of tobacco, meal, and malt spirits, frequent washing with lye, a mouthwash of vinegar, and steady warmth.<sup>93</sup> Another farmer reportedly kept his cattle from water when the symptoms of the infection appeared; if they drank cold water they certainly died. "They should be kept dry and warm, giving half a pint of linseed-oil every day, or oftener, if thought needful, till recovered; warm caudle, sweetened with treacle, for their drink, and cabbage, or savoy-leaves, to eat, till they could eat good hay." Not one so treated had died. The farmer also smoked his clothes well over a wood fire, so that he never carried the plague.<sup>94</sup>

Although the distemper had largely subsided by 1755 it broke out periodically in after years. In Essex in 1757 the justices forbade cattle markets and fairs.<sup>95</sup> The statute of 30 George II, c. 20 (1757) provided that anyone obstructing the execution of the King's orders forfeited £50 as he did also if he entered into a combination to disobey or defeat the same. The old rules about tanners, drovers, and dealers still carried the same penalties as earlier.<sup>96</sup>

In this same year Daniel Layard published his *Essay on the Nature, Causes, and Cure of the Contagious Distemper among the Horned Cattle in these Kingdoms* (London 1757), arguing that "the several stages, the progress, and effects of this distemper are exactly the same with those of smallpox."<sup>97</sup> After describing in detail such symptoms as have frequently been cited above, he went on to say that a milch cow dried up about the

<sup>89</sup> *Ibid.*, 24:44, 108, 576, 577 (1754). On Jan. 10, 1754, the Antigallicans gave 5 guineas "to an honest, industrious old couple," greatly distressed by the loss of their cows.

<sup>90</sup> *Ibid.*, 25:56, 464 (1755).

<sup>91</sup> *London Magazine*, 24:171 (1755).

<sup>92</sup> *Ibid.*, 26:258 (1757); *Gentleman's Magazine*, 27:186, 478 (1757). In January 1759, the King ordered a thanksgiving for the ceasing of the distemper "in all churches and chapels on Sunday, the 8th of February next." *London Magazine*, 28:50 (1759); *Annual Register*, 2:66 (London, 1759).

<sup>93</sup> *London Magazine*, 26:319-320 (1757).

<sup>94</sup> *Gentleman's Magazine*, 27:249-252 (1757). Layard (1721-1802), one time physician at Middlesex Hospital, wrote variously on medical subjects.

<sup>89</sup> *London Magazine*, 24:89 (1755). See also *Gentleman's Magazine*, 24:93, 493, 549 (1754); *Scots Magazine*, 16:516, 581 (1754). Also in connection with inoculation, see Malcolm Flemyng (d. 1764), *A Proposal in order to Diminish the Progress of the Distemper amongst the Horned Cattle, Supported by Facts* (1754, 1755). The author was a Scottish physician of excellent training and reputation, who was well abreast of the best physiological doctrines and had wide medical interests. In 1755, the *Universal Magazine*, 17:153-154, printed his recipe for the distemper: antimony, treacle, ethiops mineral, and milk.

<sup>90</sup> *Gentleman's Magazine*, 25:160-161 (1755).

<sup>91</sup> *Ibid.*, 464.



fourth day, her purging became more violent, her anus irritated, and she was at her worst in the evening when death was most likely. The crisis came about the seventh day; then if the eruptions broke, the dung was more firm, abscesses formed in the horns, the urine became thicker, shivering was followed by general warmth, the pulse became regular, and the beast responded to one's presence and ate a little, the danger was past. If, however, the eruptions did not break and the other symptoms did not follow, the case was hopeless.

At the first signs put the beast in a large well-littered shed, change the litter daily, provide good ventilation without drafts, keep the victim warm, bleed if not too weak, wash with warm water and vinegar, spread aromatic herbs about, curry to promote circulation, and anoint the udders with warm oil to preserve milch. After bleeding make a rowel with hemp, a foot long and an inch thick covered with hog's lard and tar, and pass it through a hole in the dewlap so that the ends hang out. Next day move this rowel back and forth, smearing the mid-part with soft ointment of turpentine and egg yolk. If the rowelled part ran too much, poultice it with lard, white bread, and milk; keep the rowel in a month after recovery. If the dung was hard and the beast feverish, purge gently with bran, lenitive electuary, spring water, and Glauber's salts, and follow with water gruel. Then feed a liquor of madder root, tumeric, horseradish root, fenugreek seed, camomile flowers, feverfew, rue, and sage boiled in small ale; feed no dry fodder, but mix with vinegar whey. Cleanse the barbs, mouth, and nostrils with a mixture of raisins, figs, mustard seed, milk, water, honey of roses, and sal ammoniac.

If on the fourth day the beast was dull and shivering, no pimples arose, and purging was imminent, drench her frequently with herbs, treacle, and vinegar whey. When a mortification seemed likely, give oak bark, Peruvian bark, myrrh boiled in water, and other simples. If after the fourth day an abscess seemed to be forming in the horn, bore in 2 or 3 inches below the tip. Open the swellings but anoint and poultice the openings. After the crisis purge mildly with rhubarb, aniseed, senna, licorice; later on, a bran mash with Epsom salts was good. Feed good sweet hay and water gruel. Sanguine beasts needed only moderate bleeding and purging and a light diet. Weakly cattle, inclined to scour, required dry fodder with a mash of malt, warm ale, and spices. Harsh purges were detrimental, and acids were to be avoided.

Warm mashes and lenitives purged lightly. Sulphur mixed with bran promoted perspiration.

With other men, Layard felt that inoculation might prevent the malignancy of the disease, but neither cows with calf nor calves should be inoculated. The cattle should first be well washed, dried and curried, placed where the air was temperate, fed good sweet hay and clean water. Inoculation should be away from the heart and lungs, and on the rump or shoulder on both sides to drain well. Open the skin enough to start the blood and inoculate with a tow smeared with matter from a recovering calf; stitch up the wound for 48 hours, then remove the tow and dress the wound with a turpentine and egg ointment. As soon as the inoculation had taken, keep the animal warm, well-rubbed, and fed with warm hay, water, and vinegar; if necessary a little dry fodder might be added. Purge gently and watch closely until the beast was fully recovered.<sup>98</sup>

According to another writer, before inoculation could give hope it must be proven that the beast could take the distemper but once.<sup>99</sup> To date no evidence had appeared that any beast had had the distemper more than once, and it was highly improbable that he could. Testimonies from various sections supported this contention. Indeed one farmer declared that his survivors of 1746 were exposed in 1749, 1755, and 1756 without succumbing. Farmers would pay higher prices for such cattle. The writer concluded by citing two examples of successful inoculation through the dewlap.

After the virtual disappearance of the murrain from England reports from the Continent attracted attention for several years. In June 1761, a letter from Stockholm related a melancholy account of the distemper in Finland where it affected even the cowherds:

... a stout young fellow, after flaying a cow dead of the distemper, at night laid himself down on the skin,

<sup>98</sup> The year following the appearance of his tract, Layard addressed the Royal Society on the usefulness of inoculation in preventing the distemper. Here he drove home his conviction of the analogy between it and smallpox. Contrary to the Marquis de Courtrivon, he insisted that cattle never took it a second time. Wherever the disease appeared its symptoms and history were the same; the survivors of one attack invariably emerged from a second epidemic unscathed. *Philosophical Transactions*, 50:528 (1758); abstract in *Monthly Review*, 21:233 (1759).

<sup>99</sup> *Gentleman's Magazine*, 29:248-249 (1759).

wrapping it about him, but the next morning was found quite stiff and dead. "The most ingenious Mr. Hartman, continues the letter, has advanced, that the symptoms of this distemper in the human species, perfectly correspond with those of the English sweating: we sometimes burn the liver, milt, and lungs of the dead beasts, and administer the powder of them to the sick beasts, on account of the volatile salts in these ashes: I hear that now they are beginning to burn whole carcasses for the same use; and likewise, to prevent the air from being infected by such a number of putrified carcasses, the cow houses also are fumigated with sulphur, gunpowder, and vinegar."

A little later the distemper was reported to be raging in several parts of the Continent.<sup>100</sup> In 1769 an investigation into the mortality in Holland disclosed that in 5 months nearly half the cattle were attacked (in some cases more), that of those attacked, 32,907 died and 10,405 recovered, and that in one instance as many as 5 out of 7 died.<sup>101</sup>

Before completing this survey of the distemper,

<sup>100</sup> *Annual Register*, 4:122, 161 (1761). Indeed it threatened steadily during the next two decades. In February and March 1763, the government imposed a quarantine against Germany, Denmark, and Sweden. *Handlist*, 104; *Scots Magazine*, 25:176 (1763). France also was infected at the same time. *Monthly Review*, 38:218 (1768). In 1769, orders in council prohibited the importation of hides, hay, and straw from foreign parts. *Handlist*, 116, 118. This state of affairs continued throughout 1770 when five orders dealt with quarantine and other preventive measures. *Handlist*, 119, 120, 121. At that, the distemper did get into Scotland but without drastic consequences. So careful indeed was the government that not only were cattle, hides, hay, and straw from infected areas forbidden entrance into the United Kingdom but the authorities went so far as to require that all hay and straw brought into the country as packing be immediately destroyed. Occasionally a recipe was printed. *Universal Museum*, 3:224-225 (1764). In 1774, 1775, and 1778, quarantines were again imposed. *Handlist*, 128, 129, 138. Contemporaneously, in 1777, the *Monthly Review*, 56:218, summarized a book on the preservatives and cures of the cattle in France where the distemper was very active. Although the quarantines were revoked in 1779 (*Handlist*, 140), the distemper still bulked sufficiently large for the Royal Society to publish Layard's remarks in 1780 on the 1769 threat. The *Monthly Review*, 64:276-277, 517 (1781), carried an account of his ideas and also reported on the distemper in the Netherlands where the peasants used marine salt as a cure. Two years later, *ibid.*, 67:553, 559, noticed a book dealing with the French experience in 1775.

<sup>101</sup> *Annual Register*, 12:166 (1769). On the occasion of this 1769 threat the government called upon Layard

it is appropriate and desirable to summarize the views of the contemporary who supplied a more comprehensive and analytical account than any other writer. Robert Dossie, in his *Memoirs of Agriculture* (London, 1768-71), devoted considerable space to "Observations on the Murrain or Pestilential Disease of Neat Cattle" which concluded by citing the mortality figures in Holland just given.<sup>102</sup> He traced the murrain from its appearance in Hungary in 1710, its spread over Europe by 1714, and its survival in some places until 1730. Ten years later, it began again and continued down to the very date of his writing. He remarked on the variations in malignancy, intensity, locality, and even symptoms. He correlated the distemper with weather conditions which might weaken cattle and render them more susceptible to attack or to fatal consequence. He noted that dark cattle were more resistant than light, bulls than oxen, oxen than cows which in turn were more susceptible when pregnant. The murrain was contagious, but in what manner he was not sure. It came through contact and not through the air. The contagious matter was long infectious.

Equally important was Dossie's judgment of antidotes. If transmission by air was rejected, fumigation as an antidote fell to the ground; indeed steaming and similar techniques spread rather than limited the contagion and thus increased the mortality. External applications did neither good nor harm. Internal medicines were possibly more harmful than beneficial inasmuch as they tended to weaken the beast. Antiseptics were always applied after contagion and therefore came too late. Since the murrain was not smallpox inoculation provided no safeguard. A second attack was entirely possible and beasts had died from inoculation. Although contagious the murrain was epidemical and only flourished when conditions were favorable. Under such circumstances medicinal antidotes had little effect. Even the means of strengthening beasts were so expensive that men often found it cheaper to let their cattle be carried off.

for advice. He recommended that cattle should be killed and buried immediately, a practice tried and found successful on the continent. He also praised inoculation as a proven treatment, for the distemper was an eruptive fever of the variolous type communicated by contact and by the effluvia carried in the air. *Philosophical Transactions*, 70:536 (1780).

<sup>102</sup> Fleming, *Animal Plagues*, 1:307-357.

Cures were no better than antidotes. The majority consisted of ancient types of alexipharmics such as rue and camphor, or resistants to putrefaction such as verjuice and vinegar, or emollients such as niter and oils, or febrifuges such as mercury and white vitriol. Such invigorating medicines as barks and cordials were often wrongly tried or insufficiently administered, and although their theoretical effect was good the actual outcome might be quite unsatisfactory. Bleeding was fatal, purging very bad, and blistering a question. Rowelling was largely irrelevant, and currying or rubbing of little avail.

Despite the signs of inflammation brought to light by post-mortems Dossie denied the murrain to be inflammatory fever and declared that treatments founded on that hypothesis must lead inevitably to failure. Indeed, he said, any analogy with a specific human disease led to false or ineffective methods. Farmers should know all the symptoms: cough, chills, loss of appetite, lethargy, drying up of milk, discharges, and ulcers. The disease was communicated by a contagious virus and in general ran a regular course. Diet and regimen should receive great attention, for the murrain was actually a struggle "betwixt the vital ferments which support the animal economy and a preternatural ferment which tends to destroy them." To keep up good circulation of the blood and the vital juices was the preventive most likely to prove effective. Astringent elements which braced the fibers were excellent in prevention and cure. Invigorating cordials also had great merit.

Dossie not only criticized many customary practices of combatting the distemper but also found the government's policy inadequate in certain respects. He thought the government slow to realize the presence of the infection and mistaken in expecting farmers to destroy their beasts when they were in fact not clear as to symptoms. Consequently a brief simple statement of symptoms should be circulated and displayed in the most public place in each parish, and some particular individual should be made responsible for seeing that the necessary information was prominently posted. He felt the requirement of 40 days' quarantine much too long, for if the cow was going to succumb to the disease she would do so in much less time, and if she carried the infection no one could say precisely how long she would be dangerous. Twelve days' quarantine was long enough. To prevent the carriage of infection in the skin it was more efficacious to clean the beast well than to wait for the seeds of the murrain to wear off.

Finally the government might very appropriately circulate some hints of preliminary treatments.

Little need be said in conclusion, for the preceding pages speak for themselves, and Dossie's views sum up the quarter century, 1745-1770, most effectively.<sup>103</sup> As suggested at the outset the whole social and economic dislocation caused by the distemper remains to be written, but the above account shows the impact upon contemporary agriculture. Over a period of a dozen years the distemper excited a very large response. In this response were hundreds of contributions, of which many will confirm the conviction that the medical knowledge and outlook of that day was hopelessly mistaken; others represent a viewpoint that bespoke a more productive and successful era in veterinary science and are therefore clues to its development. Specific reference has been made, at the risk of undue repetitiousness, to many recipes because it has seemed desirable to indicate the total character of veterinary practice at that day and to drive home the full impact of the murrain upon English opinion and society. By and large one may trace a steady development of a more scientific viewpoint during the epidemic. Before its course was run the number of folklore prescriptions declined, and the suggestions marked a distinct advance over the generality of earliest contributions. The government deserves a tribute, regardless of the justice of Dossie's criticism, in that its measures consistently reflected the most enlightened opinion. Farmers and laymen might protest or they might prefer traditional specifics; some physicians might propose questionable hypotheses; but the government took a stand, irrespective of its popularity, in conformity with what now appears to have been the best advice, and except for a few modifications, which were apparently justified, courageously clung to that stand. All in all then the cattle distemper of mid-eighteenth-century England provides considerable insight into the history of science and of general social evolution.

<sup>103</sup> After 1780 English interest largely disappeared for nearly a century, but reference may be made to Joseph Downing, *A Treatise on the Disorders Incident to Horned Cattle . . . To Which Are Added Receipts . . .* (1797) and to the fact that the death of Layard in 1802 prompted the *Monthly Magazine*, 13:240 (London, 1802) to sketch the distemper of 1744-56 and its threatened revival in 1769. The tragic visitation of the 1860s brought extensive activity by government, farmers, and physicians alike.



## THE FEDERAL RESERVE POLICY AND THE AGRICULTURAL DEPRESSION OF 1920-1921

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Economic depression and its concomitants of falling prices, financial distress, bankruptcy, and foreclosure, it would seem, have been the invariable heritage of the American farmer since the time of the first English settlements in North America over three hundred years ago. The sharp decline in the price of Virginia tobacco on the London market in the 1620s, for example, and the subsequent frantic efforts of the planters to restrict production and raise prices marked the beginning of the economic difficulties of the American producers whom Thomas Jefferson once eulogized as "the chosen people of God." The story of agricultural distress in the early period has been well chronicled;<sup>1</sup> suffice it to say that economic depression has been one of the chief themes in American agricultural history.

During the latter months of 1920 there occurred a decline in agricultural prices that abruptly ended the cycle of rising farm prices which had got under way in 1897; the price decline was all the more disastrous because it came suddenly and without warning. Crops were unusually large in 1920. Corn production reached the all-time record peak of 3,208,584,000 bushels, exceeding even the bumper crop of 1912. Wheat production was only 833,027,000 bushels in 1920 and was considerably below the production record for 1918 and 1919, but it was an above-average crop. The cotton crop in 1920 was 13,440,000 bales, the largest crop since 1915. Because of the high level of wages and prices for fertilizer and farm equipment, the crops of 1920 were produced at the greatest cost the American farmer had ever expended for planting and harvesting his products. "They were incurred willingly," to use the words of Secretary of Agriculture Henry C. Wallace, "because the farmers had been told over and over again that overseas

there was a hungry world waiting to be fed and that there would be a strong demand for all they could produce."<sup>2</sup>

The general price level of agricultural products rose steadily during the first half of 1920. Wheat, which was selling at \$2.34 per bushel on January 15, reached \$2.56 on June 15; cotton advanced from 39.26 cents a pound on January 15 to 41.20 cents on July 15; corn showed an even greater advance—from \$1.44 per bushel on January 15 to \$1.85 on June 15. The price of hogs, per hundredweight, however, had dropped from 19.30 cents on August 15, 1919, to 13.36 cents on January 15, 1920; but even this price remained steady until November. Wheat began a steady gradual decline in price in July. On October 15 the average price was \$2.01 per bushel; within a month it had declined to \$1.66, and by August 1921 it was selling at \$1.03. The bottom dropped out from under cotton prices during the last 5 months of 1920. The average spot price of middling cotton on the New York exchange declined from 41.20 cents a pound on July 15 to 15.68 cents on December 15, and by June 15, 1921 cotton was quoted on the New York market at 12 cents a pound. Corn producers, however, suffered the hardest blow; the price of corn declined from \$1.85 per bushel on June 15, 1920 to \$1.04 in October, 66.8 cents in December, and 61 cents in May 1921. Even then the bottom of the pit had not been reached, for the year ended with corn selling at 42 cents a bushel! The price of hogs declined rapidly, to be sure—from \$13.18 per hundredweight on June 15, 1920 to \$11.64 in November, \$8.90 in December, and \$7.22 in June 1921—but the percentage decrease in the price of hogs was not as great as that of the prices of the other agricultural products cited above.<sup>3</sup> Thus, within from 11 to 16 months, the price of wheat decreased to approximately 40 percent of its highest price in 1920, corn to 32 percent, cotton to 34 percent, and hogs to 50 percent.

<sup>1</sup> See especially Lewis C. Gray, *History of Agriculture in the Southern United States to 1860* (Washington, 1933); Percy Wells Bidwell and John I. Falconer, *History of Agriculture in the Northern United States, 1620-1860* (Washington, 1925); and the historical articles in the U. S. Department of Agriculture *Yearbook* for 1940.

<sup>2</sup> U. S. Department of Agriculture, *Yearbook*, 1921, p. 4.

<sup>3</sup> *Ibid.*, 1926, p. 818, 845, 975, 1101.



Bare figures of the prices of agricultural products, however, fail to convey the full measure of agrarian financial distress. The financial position of the farmer had been strengthened during the inflation of the war years and especially during 1919 and the first half of 1920. Farmers had passed from a period of relative stability into one of dazzling prosperity. The price of land had consequently skyrocketed, especially in Iowa and the great Corn Belt, and land rents had increased from 100 to 200 percent. Thousands of farmers had extended their land holdings at the risk of mortgaging their farms, livestock, and equipment. The disastrous price level of 1920-1921 wiped out most of the gains of the war years and tens of thousands of independent farmers were now confronted with foreclosures, tenancy, and the loss of their life savings and their homes and farms.

It was a dreary picture, to be sure, and if it were the whole story it would suffice to illustrate the reality of agricultural unrest. There was, besides, the burden of increased transportation costs and an increased tax load to add to the heavy measure of financial distress. In 1913, for example, transportation and elevator charges accounted for 23 percent of the price of corn shipped from Sioux City, Iowa, and sold on the Chicago market; in 1919 the figure had declined to 20 percent, yet on December 1, 1921 it had risen to 44 percent.<sup>4</sup> Secretary Wallace described the situation in 1921 in the following terms:

The cost of getting farm products from the farm to the consumer's table has increased tremendously during the past three years. The freight charge is very nearly doubled, and in some cases more than doubled. When wheat was selling at \$2.50 per bushel, corn at \$1.75, cattle and hogs at \$16 to \$22 per hundred, cotton at 30 cents per pound, the increased freight rate was not a serious matter. It amounted to but few cents relatively and was a small item in the total price. But with wheat at \$1, corn at 48 cents, cattle and hogs at \$7 to \$10 per hundred, cotton at 17 to 20 cents (all these being primary market prices, not farm prices), the addition of even 10 cents per bushel or per hundred pounds imposes a burden grievous to be borne. When farm prices are ruinously low any addition to the freight charge means added distress. At the present time the cost of getting some farm products to market is greater than the amount the farmer himself receives in net return.<sup>5</sup>

In the face of declining prices, taxes on agricultural land either remained stationary or else increased. Property taxes paid by the farmers increased, in absolute figures, from \$532,000,000 in 1920 to \$797,000,000 in 1922. On 155 farms in Ohio, Indiana, and Wisconsin, for example, taxes accounted for 9.8 percent of the farmers' net receipts in 1919, 17 percent in 1920, and 33 percent in 1921.<sup>6</sup>

In the midst of the acute financial distress prevalent in the fall of 1920, the farmers turned to the Federal Government for financial support. On October 13 leaders of the American Cotton Association, who were meeting in Washington, bombarded W. P. G. Harding, Governor of the Federal Reserve Board, with questions regarding the policy of the Federal Reserve System with reference to the extension of agricultural credit. Harding declared that the Board was then in session and that its policies could not be announced at the immediate moment. He told the cotton delegation, however, that he believed orderly marketing of the staple was the solution of their problem, and that they might find it necessary at times to sell their cotton at prices which were below production costs.<sup>7</sup> The following day certain representatives of the southern and western farmers visited the Secretary of the Treasury, David F. Houston, and demanded credit extensions to aid them in financing the marketing of their crops. Houston indicated that the Treasury Department could do no more than it was then doing to aid the farmers; and he frowned upon the proposal, suggested by agrarian spokesmen, to reestablish the War Finance Corporation to enable Germany and Austria to buy American cotton. J. S. Wanamaker, president of the American Cotton Association, explained the tragic situation and concluded: "God pity a nation that won't lend money to its people to aid agriculture."<sup>8</sup>

A period of ruinous deflation such as the farmers experienced in 1920-1921 necessitates immediate credit if the farmers are to survive as independent farmers; and of course it was credit that they demanded—credit to meet impending debt payments, to enable them to hold their crops until prices had recovered from the first effects of the panic. Federal Reserve banks discounted agricultural and

<sup>4</sup> *Ibid.*, 1921, p. 8.

<sup>5</sup> *Ibid.*, 7-8.

<sup>6</sup> *Ibid.*, 1922, p. 7; 1923, p. 8.

<sup>7</sup> *New York Times*, Oct. 14, 1920.

<sup>8</sup> *Ibid.*, Oct. 15, 1920.

livestock paper maturing from 90 to 180 days, and this could afford some measure of relief; but there was no Federal machinery for providing intermediate agricultural credit of from 6 months to 3 years. The insurance companies, trust companies, etc., which had normally provided this intermediate credit, had largely withdrawn from the lending market and as a consequence the chief burden of "carrying the farmers through" fell upon the commercial banks—and ultimately upon the Federal Reserve System.<sup>9</sup>

The simple fact was that the Federal Reserve banks, because of the narrow restrictions of the Federal Reserve Act, could not meet the crisis. The result was a general and wholesale assault upon the System by numerous agrarian spokesmen during 1920-1922. The charges hurled at the Federal Reserve Board and the Reserve banks were numerous and diverse, general and particular, and once again the latent agrarian hatred of banks and bankers burst forth in full fury against, ironically enough, the crowning achievement of the progressive Wilson administration. Essentially the root of the farmers' disaffection can be seen in their belief that an inflationary Reserve policy was desirable and possible and that the Federal Reserve Board was chiefly responsible for the deflation of agricultural prices in 1920. One southern agricultural journal, for example, reflected an opinion that was very common when it charged that the Board had refused to extend credit to the farmers on virtually any terms and had made the rediscount rate on agricultural and livestock paper prohibitive. "Never in the history of the world," it declared, "has so much power reposed in the hands of a few men as that now at the disposal of the Federal Reserve Board. . . ."<sup>10</sup> The charge that the Federal Reserve Board had deliberately and maliciously set out upon a policy aimed at deflating agricultural prices in 1920 was more serious, but it was made many times by numerous self-constituted agrarian spokesmen and was undoubtedly believed by many farmers. One irate cattle grower in Mississippi even charged that the Board's alleged deflationary program was the work of a few Jewish international bankers who controlled the Federal

Reserve System and who were endeavoring to secure a monopoly of the world gold supply.<sup>11</sup>

It is pertinent at this point to summarize the accusations made against the Federal Reserve System. Briefly, they were: (1) The Federal Reserve Board had undertaken a general credit deflation by increasing the rediscount rate on paper secured by farm products and land. (2) The Reserve banks had denied funds to the agricultural sections in order that the money might be employed in speculation on Wall Street. This was a popular taunt of the more ignorant agitators, and Reserve spokesmen made especial efforts to refute it.<sup>12</sup> (3) The small banks in the agricultural areas had been treated unfairly as compared with the large city banks, and the country banks were required to increase the collateral on their borrowings from the Reserve banks to an excessive degree. (4) The statements given out by the Secretary of the Treasury, the Governor of the Federal Reserve Board, and the Reserve bank spokesmen, which had been construed to the effect that commodity prices, particularly the prices of farm products, were too high and that a pre-war price level had to be reached within a short time, had contributed to the depression of prices.<sup>13</sup>

Next to George M. Armstrong's broadside, *The Crime of '20*, which was a sizeable volume and a semiserious attempt to expose the Federal Reserve policy, the most violent attacks upon the System came from the spokesmen of agrarian interests in Congress. Charges were thrown wildly about during 1920-1922, and it will suffice to examine a few of the typical outbursts. Senator Furnifold M. Simmons of North Carolina, himself no flaming radical, opened the congressional attack upon the System on December 20, 1920, by declaring that the Reserve banks had placed special restrictions upon loans made on crops. "It is not in the public interest that the products of the farms of this country should be sold for one-half the cost of their production," he asserted. He further charged that the response of the Reserve banks to the plea for extensive agricultural credits had been that

<sup>11</sup> George W. Armstrong, *The Crime of '20: The Unpardonable Sin of Frenzied Finance*, 81-87 (Dallas, 1922).

<sup>12</sup> See Rich, *The Federal Reserve Bank and the Farmer and Stockman*, 6.

<sup>13</sup> Ivan Wright, *Bank Credit and Agriculture*, 271-272 (New York, 1922); and Benjamin Haggott Beckhart, *The Discount Policy of the Federal Reserve System*, 475-476 (New York, 1924).

<sup>9</sup> See John H. Rich, *The Federal Reserve Bank and the Farmer and Stockman*, 4 (Minneapolis, 1921). Rich was chairman of the Minneapolis Federal Reserve Bank.

<sup>10</sup> *Southern Planter* (Richmond, Va.), 83(7):11 (Apr. 1, 1922).

they, the banks, were endeavoring to reduce prices, and that the member banks should do nothing which would tend to enhance the price of agricultural products. While Congress was considering a proposal to help the farmers export their surpluses, Simmons continued, the Federal Reserve Board had promulgated stringent rules of credit and had prevented the farmers from holding their crops until a government-sponsored export corporation could be organized.

There can be no doubt . . . that when the farmer was confronted by a situation of having to sell his product, if he sold it at all, in a market which had been driven down and beaten down until it did not carry a price that would amount to one-half of the cost of production of the crop, that situation was further accentuated when the Federal Reserve Board indicated to the Federal reserve banks and to the member banks that it was undesirable that money should be lent for the purpose, as they phrased it, of withholding crops from the market.<sup>14</sup>

The leadership of the anti-Reserve forces in Congress, however, soon passed from the conservative Senator from North Carolina to Senator J. Thomas Heflin of Alabama, the long-haired Klan embodiment of post-war southern demagoguery. From time to time during 1921, Heflin rose pompously to condemn the entire System as the wilful agent of agricultural destruction. On one occasion, for example, he declared:

The conduct of the Federal Reserve Board for several months past has been miserable, inexcusable, and indefensible. It has been criticized and condemned by farmers, merchants, and bankers, and others all over the country, and its conduct will go down in the history of this decade as a crime against agriculture, commerce, and honest banking in the United States. . . . To-day the Federal Reserve Board holds its foot upon the neck of the grain industry, the cattle industry, and the cotton industry and other industries of the United States, while Wall Street and Chicago look on and applaud. . . .

Mr. President, when a board institutes a policy that destroys the business of thirty-odd millions of people in my section and thirty-odd millions of people in another section of the country—the western section of the United States—it is certainly a criminal act.<sup>15</sup>

Another typical outburst of the agrarian spokes-

men in Congress was the statement of Representative Phil D. Swing of California on May 23, 1922.

You can "bear" the market or you can "bull" the market. The Federal reserve bank deliberately set out to "bear" the market. They succeeded so well that they broke the market—not only broke the market but broke the farmers as well. We there saw the strange spectacle of the farmer citizens of this country being ruined by being forced to sell their products on a glutted market, at less than what it cost to grow them, as a direct result of a policy adopted by their own Government—a Government created to aid them, not to harass them. I say it was criminal, it was damnable for this all-powerful agency of our Government to deliberately crucify the farmers of this country.<sup>16</sup>

What shall we say of these various accusations? What was the actual role that the Federal Reserve Board and banks played during the period of agricultural deflation and distress? In the first place, what, exactly, was the part the Federal Reserve Board played in bringing about the general deflation in the price level during 1920 and 1921? It is clearly evident that the spiral of inflation which had beset the country in early 1919, following the removal of most wartime price controls, alarmed the members of the Board. Writing late in that year, Governor Harding announced the Board's determination to set the machinery of the Federal Reserve System into motion in order to bring about a mild and gradual deflation. "The expansion of credit set in motion by the war must be checked," he warned. "Credit must be brought under effective control and its flow be once more regulated and governed with careful regard to the economic welfare of the country and the needs of its producing industries." Too drastic a deflation, he declared, would defeat the purpose of a well-regulated credit system "by the needless unsettlement of mind it would produce and the disastrous reaction that such unsettlement would have upon productive industry."<sup>17</sup>

The alarm of the Federal Reserve Board had been occasioned by the disturbing flurry of speculation in stocks and bonds and foreign trade operations and also by the continuous inflation of prices and credit throughout 1919. It was significant that the credit basis for this speculation had been in part the government bonds which the member

<sup>14</sup> *Congressional Record*, 66 Congress, 3 Session, Dec. 20, 1920, 60(1):551.

<sup>15</sup> *Ibid.*, 67 Congress, 2 Session, Dec. 19, 1921, 62(1):517.

<sup>16</sup> *Ibid.*, May 23, 1922, 62(7):7517.

<sup>17</sup> U. S. Federal Reserve Board, *Annual Report*, 1919, p. 71-72.

banks discounted and the Reserve banks were legally required to rediscount. It was evident, especially to the officials of the Reserve banks, that an advance in the discount rate was essential to restrict credit and restore prices to a reasonable level.<sup>18</sup> Consequently, the Board set out in the latter part of 1919 to increase gradually the Reserve discount rate and when Secretary Carter Glass consented, the rates in the twelve regional banks were increased approximately one-half of one percent. The discount rate on agricultural and livestock paper stood at from 5 to 5½ percent during November and December 1919.

According to Governor Harding, the Board was reluctant early in 1920 to approve a discount rate higher than 6 percent for any of the Reserve banks.

therefore," he declared, "is to check further expansion and to bring about a normal and healthy liquidation without curtailing essential production and without shock to industry. . . ." John Skelton Williams, Comptroller of the Currency and afterwards a caustic critic of Harding, declared that each bank should be "a missionary for thrift" and warned that "a proper and reasonable degree of contraction" was necessary. Toward the end of the conference, according to Harding, there was some discussion as to the possibility of increasing the Reserve discount rate, but nothing definite was decided on the matter at the time.<sup>19</sup>

Before the Washington conference had gathered, however, the Board had approved in February an increase in the discount rate on agricultural and

TABLE 1

*Discount Rates on Agriculture and Livestock Paper Maturing within 91 to 180 Days, for Dates on which Changes Occurred, 1919-1921*

Reserve Bank	Nov. 20, 1919 %	Feb. 2, 1920 %	June 1, 1920 %	July 1, 1920 %	Nov. 1, 1920 %	Jan. 1, 1921 %	Mar. 1, 1921 %	May 1, 1921 %	June 1, 1921 %	July 1, 1921 %	Aug. 1, 1921 %	Oct. 1, 1921 %	Dec. 1, 1921 %
Boston.....	5	6	6	7	7	7	7	6	6	6	5½	5	4½
New York.....	5	6	7	7	7	7	7	7	6½	6	5½	5	4½
Philadelphia.....	5	6	6	6	6	6	6	6	6	6	5½	5½	4½
Cleveland.....	5½	6	6	6	6	6	6	6	6	6	6	5½	5
Richmond.....	5	6	6	6	6	6	6	6	6	6	6	6	5½
Atlanta.....	5½	6	6	6	7	7	7	7	6	6	6	6	5½
Chicago.....	5½	6	7	7	7	7	7	7	6½	6½	6	6	5
Saint Louis.....	5½	6	6	6	6	6	6	6	6	6	6	6	5
Minneapolis.....	5½	6	7	7	7	7	7	7	6½	6½	6½	6½	5½
Kansas City.....	5½	6	6	6	6	6	6	6	6	6	6	6	5
Dallas.....	5½	6	6	6	6	6	7	7	6½	6	6	6	5½
San Francisco.....	5½	6	6	6	6	6	6	6	6	6	5½	5½	5

Compiled from the *Federal Reserve Bulletin*, 1919-1921, *passim*.

In order to determine the views of a larger number of the bankers than were represented by the twelve members of the Federal Advisory Council, the Board invited the three "Class A" directors of each Reserve bank to confer with the Council and the Board on May 18, 1920. This was the famous conference which certain agrarian critics denominated as "the crime of 1920." In his address before this conference, Harding outlined the recent history of the tremendous expansion of bank credits which had occurred since 1917 and emphasized that there had been a greater expansion of bank credit from April 1, 1919 to April 1, 1920 than had occurred during the 19 months of the war. "Our problem,

livestock paper to the general level of 6 percent for all twelve Reserve banks. In light of the charge by agrarian spokesmen that the Federal Reserve Board embarked upon a policy to deflate agricultural prices by raising the discount rate on agricultural and livestock paper, it is significant that with two exceptions, no change in the rate occurred after July 1, 1920. Table 1 explains the discount policy of the System with regard to agricultural paper during 1919-1921.

What shall we say of the charge that the increase in the discount rate of farm paper was responsible for the deflation in farm prices? It was the opinion

<sup>18</sup> Henry Parker Willis, *The Federal Reserve System*, 1298-1301 (New York, 1923).

<sup>19</sup> W. P. G. Harding, *The Formative Period of the Federal Reserve System*, 171-172 (Boston and New York, 1925).



of the Congressional Joint Commission of Agricultural Inquiry, which was allegedly heavily "loaded" against the Federal Reserve System, that during the early months of 1920 the Reserve banks "were confronted with a choice between continuing the high discount rates and the consequent pressure and hardship upon the commercial and agricultural industries of the country on the one hand and a policy of lower discount rates involving a possible financial crisis in the midst of an industrial crisis."<sup>20</sup> Furthermore, the Joint Commission believed:

It seems probable that a change in the policy of the Federal reserve system with reference to discount rates would have accomplished a reversal in part of the psychological and economic factors which at this time were moving in the direction of lower prices, and at the same time would have tended to induce on the part of banks a more liberal attitude toward furnishing additional credit.

One wonders whether political considerations or economic fact dictated this conclusion. Certainly it is obvious that the rise in the discount rate on the paper secured by farm products and equipment in no wise operated to halt the rising prices of farm goods during the spring and summer of 1920; and it is just as doubtful that the increase in the discount rates played any part, one way or the other, in the deflation that followed during the fall. As for the Joint Commission's charge that the increased discount rates operated to restrict agricultural credit granted by member banks,<sup>21</sup> it will be shown that such definitely was not the case.

Ogden L. Mills presented a significant dissenting opinion that, in my opinion, offers a fairly conclusive answer to the Joint Commission's innuendo that there was a connection between increased discount rates and falling farm prices. Mills thought that the suggestion was out of harmony with the balance of the report and inconsistent with the facts brought out by the investigation. Higher discount rates, he asserted, did not cause the break in prices; and, he continued: "it is inconceivable that their reduction could have counteracted the economic forces that were leading to inevitable deflation." In addition, he pointed out the following facts: (1) Reserve discount rates were below market rates throughout all of 1920. (2) There

were some 28,210 banks in the United States, only 9,840 of which were members of the Federal Reserve System. Any number of the nonmember banks were unhampered by competition and charged rates allowed by local custom and law. "For instance, what efficacy can the decrease in the rediscount rate of a Federal reserve bank from 7 to 6 per cent have on a western or southwestern bank charging 8, 10, or 12 per cent?" (3) Banks in the agricultural counties received increased credit of 56.6 percent from May 4, 1920 to April 28, 1921, while during the same period borrowings from Reserve banks in nonagricultural counties decreased 28.5 percent. "If the statement which I question be true," Mills added, "it would seem to follow that a lower rediscount rate would have tended primarily to maintain industrial prices to the further disadvantage of the farmer." (4) While it could not be conclusively proved that credit stringency was not an initial contributing factor to price deflation, there was no evidence to demonstrate that it was. "I do not believe that increased interest rates and contracting credit were the primary causes of the sharp price deflation which characterized the second half of the year 1920." No relationship could be established between increased discount rates and the drop in the price of any single agricultural commodity. The price deflation movement was world-wide; it began in Japan with the break in the silk market in 1919. The opinion that increased discount rates was one of the primary causes of the decline of agricultural prices in the United States, Mills concluded, was "so contrary to economic facts and to the purposes of the Federal reserve system, that any expression of opinion which seems to support it, even indirectly, should not be permitted to pass unchallenged."<sup>22</sup>

The causes of the decline in agricultural prices must be found elsewhere: in the alarming decline in agricultural exports, in the overexpansion in production and the absence of crop controls, in the inability of Central Europe to buy American farm commodities, in the decline in governmental purchases, in the fact that some contraction and deflation had to come after the war and post-war inflation, and in the large quantities of crops carried over from 1919 to 1920—all of which served to glut the domestic and foreign markets and to depress the price level in general.<sup>23</sup>

<sup>20</sup> U. S. Congress, Joint Commission of Agricultural Inquiry, *Report of the Joint Commission of Agricultural Inquiry*, pt. 2, p. 14 (67 Congress, 1 Session, *House Report* 408, serial 7922, Washington, 1921-1922).

<sup>21</sup> *Ibid.*, 7.

<sup>22</sup> *Ibid.*, 158-159.

<sup>23</sup> For the best discussion of the causes of the agricultural depression of 1920-1921, see *ibid.*, pt. 1, *The Agricultural Crisis and Its Causes*.

Critics of the Federal Reserve policy were on sounder ground when they leveled their charges against the progressive rate instituted by certain Reserve banks in 1920. At the request of the Federal Reserve Board, Congress on April 13, 1920 approved the so-called Phelan amendment to the Federal Reserve Act, which provided that, subject to the approval, review, and control of the Federal Reserve Board, discount rates might be graduated or progressed on the basis of the amount of the advances and discount accommodation already extended by the Reserve banks to the borrowing banks.<sup>24</sup> Acting under this authorization, the Reserve banks in Atlanta, Saint Louis, Kansas City, and Dallas—all centered in agricultural districts—instituted progressive rates.

The progressive rate operated to penalize the bank that was borrowing excessively in direct proportion to its excess borrowing.

The theory upon which the progressive rate was applied was that inasmuch as the resources of the Federal reserve bank consist wholly of the contributions of the member banks to the deposits and capital of the Federal reserve bank, that all any member bank can be considered as entitled to borrow with due regard to the interests of all other member banks is its proportion of the amount it could borrow if all the banks were borrowing their full proportion at the same time. . . . If it borrows more than this amount, it is borrowing at the expense of the other banks, and, therefore, should pay a rate of interest in proportion to the excess which it borrows above the amount which it is entitled to borrow on the foregoing theory; that is, in excess of its basic line.<sup>25</sup>

The inauguration of the progressive rate naturally evoked a considerable burst of anger from many of the small country banks that had been borrowing in excess of their reserves. These complaints, in general, may be summarized as follows: (1) The progressive rate caused the imposition of exorbitantly high rates of interest and discount on loans by member banks; and (2) its application resulted in excessive pressure upon member banks borrowing from Federal Reserve banks to reduce their borrowings. A few unfortunate incidents occurred, such as the case of the Alabama bank which neglected to maintain its reserves and borrowed so heavily that it was charged a rate of 87½ percent! The penalties in excess of 12 percent

were afterward refunded by the Atlanta and Kansas City banks. The rebates amounted to \$9,108.66 in the Atlanta district and to less than \$300 in the Kansas City district.

Probably the only serious indictment that the historian can make against the progressive rate was that it was, in the words of H. Parker Willis, a "serious and regrettable departure from the theory of the Federal Reserve Act" and a clumsy and ineffective method of checking the credit operations of weak member banks.<sup>26</sup> Certainly there is evidence enough to prove that the operation of the progressive rate in no wise caused a perceptible

TABLE 2

*Estimated Amounts of Paper Rediscounted with Federal Reserve Banks Based on the Production and Sale of Farm Products, 1919-1920*

Bank	1919 1,000 dollars	1920 1,000 dollars
Boston . . . . .	2,642	4,979
New York . . . . .	no data	no data
Philadelphia . . . . .	2,971	3,580
Cleveland . . . . .	612	1,753*
Richmond . . . . .	102,000	325,000
Atlanta . . . . .	91,300	230,000*
Chicago . . . . .	47,263	128,408
Saint Louis . . . . .	220,000*	665,000*
Minneapolis . . . . .	75,000	225,000
Kansas City . . . . .	123,481	229,432
Dallas . . . . .	28,997	44,911
San Francisco . . . . .	35,000	122,000
Total . . . . .	729,266	1,980,063

\* Data for 11 months only.

Source: U. S. Federal Reserve Board, *Annual Report*, 1920, p. 16-17.

restriction of credit in agricultural areas. The number of banks affected, in the first place, was small and insignificant. Moreover, the average discount rate charged by the New York Federal Reserve Bank during 1920 was higher than the rate charged by the Dallas bank and the same as that charged by the Atlanta bank; in 1921 the average rate charged by the New York bank was higher than that charged by the Reserve banks in Atlanta, Saint Louis, and Dallas.<sup>27</sup> But the damage had

<sup>24</sup> Willis, *The Federal Reserve System*, 1342.

<sup>25</sup> U. S. Federal Reserve Board, *Index-Digest of the Federal Reserve Act and Amendments*, 32 (ed. 3, Washington, 1924).

<sup>26</sup> *Report of the Joint Commission of Agricultural Inquiry*, pt. 2, p. 55.

<sup>27</sup> Edmund Platt, Acting Governor of the Federal Reserve Board, submitted a thorough and comprehensive account of the operation of the progressive rate to the Senate in 1923. See this report in *Congressional Record*, 67 Congress, 4 Session, Jan. 27, 1923, 64(3): 2555-2590.

TABLE 3

*Total Amount of Agriculture and Livestock Paper Combined, Held by Each Federal Reserve Board on the Last Friday of Each Month, 1919-1920*

Month	1919	1920
	1,000 dollars	1,000 dollars
January.....	59,001	56,905
February.....	63,917	67,195
March.....	67,373	74,665
April.....	66,881	106,382
May.....	58,991	140,691
June.....	68,256	168,038
July.....	63,604	202,520
August.....	57,901	216,278
September.....	60,205	224,424
October.....	55,475	240,649
November.....	52,550	245,599
December.....	51,068	246,938*

\* Figures of Thursday, Dec. 30.

Source: U. S. Federal Reserve Board, *Annual Report*, 1920, p. 18.

paper, or had it reduced the amount of currency in circulation, then a damaging bill of particulars might have been drawn up by the agrarian spokesmen against the Federal Reserve Board and the regional banks.

The truth of the matter is that agricultural credit during 1920 was expanded tremendously in order to meet the crisis precipitated by the sudden decline in farm prices in the fall. The total figures for 1919 and 1920 are given in Table 2.

The figures in Table 3 on the total amount of agricultural and livestock paper held by all the Federal Reserve banks on the last Friday of each month during 1919 and 1920 illustrate better the steady expansion, month by month, of agricultural credit that was taking place during the latter part of 1920. It should be reiterated that the figures cited in this table represent the total holdings of agricultural and livestock paper in all the Reserve

TABLE 4

*Federal Reserve Notes in Circulation, 1919-1921*

Bank	Oct. 31, 1919 1,000 dollars	Feb. 27, 1920 1,000 dollars	June 25, 1920 1,000 dollars	Sept. 24, 1920 1,000 dollars	Dec. 30, 1920 1,000 dollars	Feb. 28, 1921 1,000 dollars	May 31, 1921 1,000 dollars
Boston.....	212,096	259,702	280,617	298,249	291,196	265,726	256,653
New York.....	750,715	826,287	859,232	855,701	864,516	797,588	715,912
Philadelphia....	216,293	242,540	248,785	272,347	280,960	259,163	230,645
Cleveland.....	243,740	283,835	315,789	350,647	350,725	310,029	268,402
Richmond.....	138,592	129,535	122,109	140,145	155,162	150,143	126,498
Atlanta.....	141,976	145,778	140,592	147,003	175,166	164,582	157,090
Chicago.....	460,397	508,925	531,449	555,188	548,191	496,964	459,838
Saint Louis.....	130,760	138,778	126,289	133,283	136,610	123,933	107,943
Minneapolis.....	83,848	81,787	77,728	81,668	80,067	71,007	61,313
Kansas City.....	95,571	102,214	97,622	107,621	111,874	100,141	83,168
Dallas.....	61,152	77,089	82,351	88,782	79,474	65,840	49,940
San Francisco.....	217,736	223,514	234,155	249,362	270,745	243,438	234,467
Total.....	2,752,876	3,019,984	3,116,718	3,279,996	3,344,686	3,048,554	2,751,869

Source: U. S. Federal Reserve Board, *Annual Reports*, 1919-1921, *passim*.

been done, and political ammunition had been furnished to such spellbinders as Senator Heflin who delighted in bemoaning the fate of the "innocent" little banks which the System "tried to crush."

It has been necessary to examine the discount policy of the Federal Reserve System because of the amazing amount of contemporary misunderstanding with regard to it, and because, also, it was and is an important part of the System's credit policy. Observers of a latter day are more interested in the fundamental question: Was there actually a contraction of credit in rural areas by the Reserve and member banks? Had the System contracted agricultural credits, had it limited unduly the rediscounting of agricultural and livestock

banks at the end of each month—not, of course, the amount rediscounted during the month.

It is well known that under the Federal Reserve System the volume of currency in circulation expands proportionately to the volume of credit extended by the member banks. The figures in Table 4 afford, therefore, another yardstick of measuring the volume of credit expansion or contraction during 1919-1921.

The figures in Table 5 on the rediscounts between the Federal Reserve banks during 1919-1921 are significant, especially because they reveal that in 1919 several of the Reserve banks in agricultural districts, notably Chicago, Saint Louis, and Min-

TABLE 5  
Rediscounts between Federal Reserve Banks, 1919-1921

Bank	1919		1920		1921	
	Rediscounted or sold by 1,000 dollars	Discounted or purchased by 1,000 dollars	Rediscounted or sold by 1,000 dollars	Discounted or purchased by 1,000 dollars	Rediscounted or sold by 1,000 dollars	Discounted or purchased by 1,000 dollars
Boston.....	20,045			969,884		204,150
New York.....		40,000	375,000	479,581		595,500
Philadelphia.....	826,521		371,600	144,579		5,000
Cleveland.....		229,017		1,406,172		194,503
Richmond.....	842,946		700,000		500,000	
Atlanta.....	82,690	5,000	307,997	52,000	65,145	
Chicago.....		1,328,338	255,000	168,500		
Saint Louis.....		140,209	309,499	13,000		
Minneapolis.....		428,613	293,500	40,000	117,000	
Kansas City.....	56,500	5,000	411,636	20,000	9,008	
Dallas.....	404,975	57,500	436,013	143,000	306,000	
San Francisco.....				23,500		

Source: H. Parker Willis and William H. Steiner, *Federal Reserve Banking Practice*, 537 (New York and London, 1926).

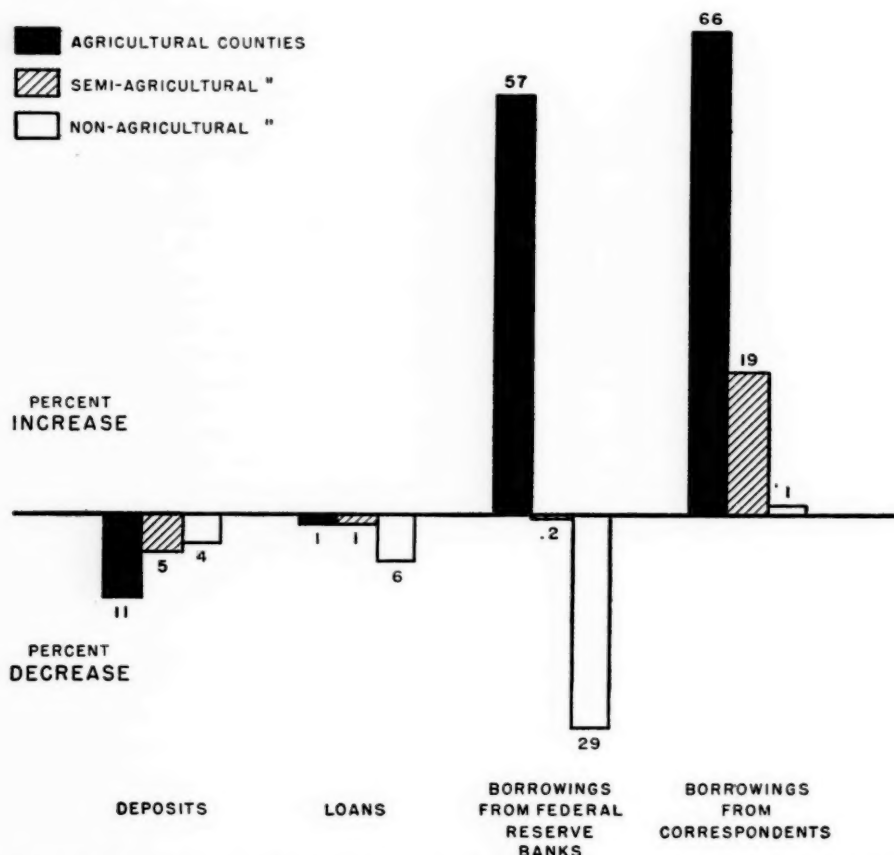


FIG. 1. Percent Change between May 4, 1920 and April 28, 1921, in Loans and Discounts, Total Deposits, and Borrowings of Member Banks in Agricultural, Semiagricultural, and Nonagricultural Counties. Source: *Report of the Joint Commission of Agricultural Inquiry*, pt. 2, p. 102.



neapolis, were purchasing the paper of the Reserve banks in industrial and commercial districts. In 1920 and 1921, the figures further reveal, the situation was entirely reversed and the Reserve banks in the industrial districts sent huge sums of money to the rural districts. The Federal Reserve Bank of Cleveland, for example, lent more in the South and West in 1920 than it did to its own member banks, which included the large banks in Pittsburgh, Cleveland, and Cincinnati. This, of course, was the way the Federal Reserve System was originally designed to operate; but these movements of inter-Reserve discounts should be sufficient evidence to prove that the South and West were not drained of credit and money at a time they so desperately needed it in order that Wall Street financiers and stockjobbers could speculate with greater ease.

Finally, the evidence in Figure 1 reveals graphically the over-all credit situation in 1920 and 1921 with regard to agricultural and nonagricultural counties. There was an increase of borrowings from the Federal Reserve banks in agricultural counties of 57 percent from May 4, 1920 to April 28, 1921, while there was a corresponding decrease of 29 percent in the borrowing of member banks in nonagricultural counties for the same period.

By way of conclusion, let us first note what the unfriendly Joint Commission of Agricultural Inquiry, after a thorough investigation of the facts, concluded:

An analysis of the figures in these studies seems to justify the conclusion:

1. That the expansion of bank loans in rural districts during the period of inflation ending June, 1920, was relatively greater than in the industrial sections, taken as a whole.

2. That the action of the Federal Reserve Board and the Federal reserve banks during the 15 months preceding April 28, 1921, did not produce a greater curtailment of bank loans in the rural districts than in the financial and industrial sections.

3. Credit was not absorbed by the financial centers at the expense of rural communities for the purpose of speculative activities.

4. That the pressure of the forces of liquidation and depression in the agricultural sections was reflected in a reduction of deposits. This reduction of deposits, particularly demand deposits, was relatively larger in the agricultural and semiagricultural counties in the United States than in the industrial counties.<sup>28</sup>

The conclusions of the Joint Commission seem to be generally warranted, although it should be noted that the second statement implies that there *was* actual curtailment of agricultural credit during 1920 and the early months of 1921. Such emphatically and obviously was not the case. Not only were the agricultural areas not injured any more than were the industrial areas by the Reserve policy, but there was, as we have seen time and again, a great expansion of credit by the System to meet the needs of the farmers during the critical deflationary period.

The upshot of the agitation during 1920 and 1921 was the appointment in 1921 of the Joint Commission which reported its findings the following year and gave the System a reasonably clean bill of health. The Commission concluded that what the farmers needed most of all by way of credit was some system of Federal intermediate credits, which the System could not supply, and which would provide credit to farmers for a period of from 6 months to 3 years. Consequently the Commission framed the measure that became in 1923 the Intermediate Credits Act.

Insofar as the anti-Reserve agitation of the agrarian spokesmen was concerned, it seems that, as so often happens, Governor Harding, the Board, and the Reserve banks were made the scapegoats of the agricultural depression by small local bankers who had grossly overborrowed, by demagogic politicians who were serving their own ends primarily, and by the farmers in general who did not understand what had happened with regard to the credit situation, but who were suffering greatly in the economic chaos of the period.

<sup>28</sup> *Report of the Joint Commission of Agricultural Inquiry*, pt. 2, p. 117.

# JAMES TILTON'S NOTES ON THE AGRICULTURE OF DELAWARE IN 1788

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A rare example of a thoughtful agricultural survey made during the decade following the American Revolution is furnished by Dr. James Tilton's answers to the queries of a French scientist. Published in 1789 by Matthew Carey in his *American Museum*, Tilton's report has received comparatively little attention from students of agricultural history or of the history of Delaware. Yet it is interesting both by reason of the source of the queries, the media through which they were forwarded, the person who answered them, and the content of the answers, as well as for their value as an example of the international transfer of scientific knowledge in the Age of Reason.

The source of the request was the Abbé Alexandre Henri Tessier (1741-1837), a French agronomist and director of the experimental farm at Rambouillet. Tessier, a "savant remarquable," was a member of the Institute of France, the Academy of Science, the Academy of Medicine, and the Central Agricultural Society. He was the founder of the *Journal d'agriculture à l'usage des habitants de la campagne* and began the publication of the *Annales de l'agriculture*. In addition to many articles in agricultural, medical, and other scientific journals, he collaborated in the preparation of the six-volume *Dictionnaire d'agriculture et d'économie rurale* (Paris, 1787-1816), and wrote *Instruction sur les bêtes à laine et particulièrement sur la race des mérinos* (Paris, 1810-11), *Instruction sur la manière de cultiver la betterave et sur les procédés à suivre pour l'extraction du sucre* (Paris, 1811), and *Histoire de l'introduction et de la propagation des mérinos en France* (1838). His special interests included Merino sheep whose introduction and popularity in France he greatly furthered, and grain diseases and their influence on humans and beasts, having been encouraged to do this latter study by Jacques Necker.<sup>1</sup>

<sup>1</sup> Pierre Larousse, *Grand dictionnaire universel du XIX<sup>e</sup> siècle*, 14:1664 (Paris, n.d.); Alexandre Bixio, "Mort de M. Tessier," *Journal d'agriculture pratique*,

Tessier's forty-four queries on American agriculture were apparently forwarded to the Philadelphia Society for Promoting Agriculture by Barbé-Marbois, French vice consul, who himself wrote on agricultural subjects and was, because of another set of queries which he forwarded, the man who caused Thomas Jefferson to prepare his *Notes on Virginia*.<sup>2</sup> Founded in 1785, the Philadelphia society had wide contacts by virtue of its location in the city then serving as the national capital.<sup>3</sup> Apparently the society forwarded copies of the queries to men in various States. But, according to Carey's introduction, the only answers submitted were those by Dr. James Tilton which are here printed.

Like Tessier, Tilton (1745-1822) was both a physician and an agriculturist. Educated at Dr. Samuel Finley's Nottingham Academy and at the College of Philadelphia where he was a member of the first class to be granted medical degrees in the English colonies, Tilton left his practice at Dover in 1776 to become a regimental surgeon and later a hospital director. Always outspoken, he denounced the hospital system employed as encouraging the spread of contagion and devised a system of log huts, ventilated by smoke, which decreased the rate of mortality. Embodying his experiences and recommendations in a work entitled *Economical Observations on Military Hospitals: and the Prevention and Cure of Diseases Incident to an Army*, published in Wilmington in February 1813,

1:326-327 (Paris, 1838); Leclerc-Thouin, "Illustrations agricoles; 1, Tessier," *ibid.*, 442-449; A. F. de Silvestre, "Notice biographique sur feu M. Tessier," Société Royale et Centrale d'Agriculture, *Mémoires*, 75:190-206 (Paris, 1839); Louis Léouzon, *Agronomes et éleveurs*, 207-220 (Paris, 1905).

<sup>2</sup> Eugene Parker Chase, ed., *Our Revolutionary Forefathers*, 21, 29 (New York, 1929).

<sup>3</sup> Rodney H. True, "Sketch of the History of the Philadelphia Society for Promoting Agriculture," Philadelphia Society for Promoting Agriculture, *Memoirs*, 6:7-10 (Philadelphia, 1939).

he was chosen as first physician and surgeon general of the army under an act of March of that year. In this capacity he directed the army medical corps during the latter part of the War of 1812. Between the two wars he had practised medicine first at Dover and then at Wilmington, to which city he moved for the sake of his health. He served as a continental loan commissioner for Delaware, a State legislator, and a member of the Continental Congress. An ardent democrat in politics, he attacked his political opponents in an anonymous pamphlet entitled *A Biographical History of Dionysius, Tyrant of Delaware*, by Timoleon (Philadelphia, 1788). For a survey prepared by Dr. William Currie, he wrote an account of the medical history of Delaware. His medical knowledge was such that he was offered the chair of materia medica at the University of Pennsylvania in 1781 but declined. Tilton's writings include articles on peach trees and the fruit curculio and an argument for the propriety of a farmer's living on the produce of his own land, in which he condemned such foreign imports as tea and wine, extolled milk, brandy, and homespun and advocated such Vergilian meals as he read of in the *Eclogues*.<sup>4</sup> At the age of seventy he had a leg amputated without anesthetic, advising the surgeons during the operation. Lean and unusually tall, Tilton was so eccentric in his manner that he was deemed "an original" by his friends.<sup>5</sup> "Original," echoed a woman who knew him, but "a Christian, a scholar, and a gentleman, though . . . without polish."<sup>6</sup>

From this brief biographical note it is obvious that Tessier's questions were in good hands, though the respondent's ardor in many cases must be recalled in assessing the value of his answers. In particular, caution should be observed because of his extreme pride in his State. For example, he wrote of Wilmington that he found it "for health, beauty, and accommodation . . . superior to any

town I have seen." Georgetown, D. C., he thought a poor second. On the other hand, he confessed that Dover, his early home, was "truly unhealthful."<sup>7</sup>

In reading Tilton's commentaries on the state of husbandry and agriculture in Delaware in 1788, one is impressed with the general similarity in the crops grown then and now. The chief crops were corn, wheat, timothy and clover hay, along with a limited acreage of oats, barley, rye, and vegetable crops. The general rotation of corn followed by wheat, and wheat followed by hay or pasture is similar to the present rotation.

Grain pests and diseases including the Hessian fly, scab, rust, and smut were as bothersome then as at present. Cockle, cheat, and garlic continue since that time to be the most troublesome weeds in small grain crops.

However, vast changes in agricultural practices have occurred since Tilton recorded his observations over a century and a half ago. The present use of grain-planting equipment and tractor-drawn machinery is a far cry from the colonial practices of planting small grains by working them into the ground with horse- or oxen-drawn harrows and by planting corn with a hoe. Likewise, the modern tractor-drawn combine which harvests and threshes in one operation 14 or 15 acres of wheat in a day is a tribute to American industry. In colonial times a man cut "an acre of wheat with a sickle in a day" and the grain was "trod out with horses."

Time has brought great changes in the wheat milling industry. Even though wheat was harvested and threshed by the most primitive methods during the colonial period, the milling of wheat, particularly along the Brandywine River, was one of the most important industries in the State. On this subject Tilton asserted: "It is the prevailing opinion in Delaware, that we have the largest and most perfect manufacture of flour, within a like space of ground, known in the world; and that this observation applies equally to the state at large, as to the particular district on the Brandywine."<sup>8</sup>

<sup>7</sup> Tilton to Currie, Dover, Apr. 20, 1791, in William Currie, *An Historical Account of the Climates and Diseases of the United States*. . . , 211-212 (Philadelphia, 1792).

<sup>8</sup> Cf., "Wilmington and its neighborhood are probably already the greatest seat of manufactures in the United States." Jedidiah Morse, *An Abridgment of the American Gazetteer*, 115 (Boston, 1798). "The most

<sup>4</sup> *Ibid.*, 1:187-192, and appendix, 34-38 (1808), 3:142-150 (1814).

<sup>5</sup> Lewis P. Bush, "Medicine and Medical Men," J. Thomas Scharf, et al., *History of Delaware, 1609-1888*, 1:474-476 (Philadelphia, 1888); Henry C. Conrad, *History of the State of Delaware*, 3:1057-1059 (Wilmington, 1908); *Delaware Register and Farmers' Magazine*, 2:106-114 (Dover, 1839); James M. Phalen, "Tilton, James . . .," *Dictionary of American Biography*, 18:550-551 (New York, 1936).

<sup>6</sup> Elizabeth Montgomery, *Reminiscences of Wilmington*, 53-54 (Philadelphia, 1851).

With the development of the vast western wheat regions, the milling industry in Delaware became of minor importance.

The soil fertility problem in Delaware is not new. In the colonial period farmers were beginning to realize that they could not long depend "on the freshness and richness of the soil," and they were giving attention to conserving manure and wood ashes. The latter was particularly satisfactory. It was found that "Two tablespoonfuls sprinkled on a hill of indian corn, after it sprouted above the ground, will be sufficient."

The cattle industry in this early period apparently consisted largely of beef cattle, and dairying as known today was practically nonexistent. Cattle were bred and grazed in the marshes and forests of the two lower counties. They were driven in large droves to the more productive meadows of New Castle County to be fattened near the slaughterhouses of Wilmington and Philadelphia. In contrast with present-day 10-month-old baby beef, cattle were not in condition for slaughter before 4 years of age.

Tilton's commentaries perhaps provide the background for the present almost universal system of share rental and paying land rents in commodities. He noted that land rents were paid in money prior to the Revolution, but with the depreciation of money following the war rents often were paid in produce. Paying rents in produce during periods of rising and falling prices does iron out many of the inequalities between landlords and tenants inherent in money rents.

With a view to making Tilton's survey of the agriculture of Delaware in 1788 more readily available the following items are here printed: (1) Tilton's letter transmitting his answers to Tessier's queries to the Philadelphia Society for Promoting Agriculture; (2) The introduction to Tilton's notes that was printed in Matthew Carey's publication, the *American Museum*; and (3) Tessier's queries as printed in the *American Museum* and Tilton's answers as found in a manuscript in the library of the Philadelphia Society for Promoting Agriculture at the Veterinary School of the University of Pennsylvania.

notable concentration of mill industries in the colonies was at Wilmington, where an ample and reliable water-power in the chief grain-growing district of America was united with river and ocean navigation." Victor S. Clark, *History of Manufactures in the United States, 1607-1860*, 1:185 (Washington, 1916).

TILTON'S LETTER ACCOMPANYING HIS NOTES ON  
DELAWARE AGRICULTURE<sup>9</sup>

Dover 6 April 1788

Dear Sir,

A variety of engagements have prevented me from attending so soon as I ought to have done, to the queries on the present state of husbandry & agriculture, in the state of Delaware, which, on behalf of the agricultural society, you were pleased to address to me. The honor done me by the society, and the zeal I have to contribute my mite to their patriotic views, constrain me to give the best answers in my power: though I hope it will be considered as some apology for the imperfect manner in which I have executed this task, that I have always been employed in a laborious professional business, and have never had it in my power, to indulge the height of my ambition, that of being settled in serene & quiet life, upon a farm.

Were I better qualified to go into minute details, brevity, I suppose, would be most agreeable to the society. The queries appear manifestly to be an enquiry, into the general state of agriculture & cultivation of this country. With a view to this object, I have endeavoured to calculate my answers as concisely as possible, and with a special regard to the satisfaction of our agricultural friends in France. I have therefore dwelt most upon our staple commodities, such as wheat, barley, Indian corn, and the manufacture of flour; but lightly touching upon other things, such as tobacco & hemp, which, though they grow very well in Delaware, are not cultivated as articles of commerce or manufacture. With the same view of brevity, I have numbered my answers correspondent to the numbers of the queries.

I am, Dr. Sir, with great esteem & regard,  
Your most obt. Servant,  
James Tilton

Samuel Hodgdon Esqr.<sup>10</sup>

<sup>9</sup> This letter is in the Philadelphia Society for Promoting Agriculture MSS., volume 3, in Veterinary School Library, University of Pennsylvania, Philadelphia. A notation on the back of the letter reads: "Doctor James Tilton's Answers to the Queries on the present State of Husbandry & Agriculture in the State of Delaware. Read June 3rd 1788. Published in Carey's Museum." According to John M. Okie, a member of the society, this notation is in the handwriting of Timothy Pickering, later Secretary of State of the United States.

<sup>10</sup> This is probably Major Samuel Hodgdon (d. 1824), "a most respectable inhabitant of Philadelphia," who



THE INTRODUCTION TO TILTON'S NOTES IN THE AMERICAN MUSEUM<sup>11</sup>

The following queries on the present state of husbandry and agriculture in the United States of America, were proposed to the Philadelphia society for promoting agriculture, by the abbé Tessier, of the academy of sciences, and of the royal medical society of Paris, through the hands of monsieur de Marbois, vice-consul of France. The only answers to them which the society has yet been favoured with, are those subjoined, for which they are indebted to James Tilton, M.D. of the state of Delaware.

The comprehensive and satisfactory manner in which this paper is written, has encouraged the society to publish it, with the queries, in hopes that qualified persons will be found in every state who will undertake the task, and furnish them with similar answers; by which it is conceived that not only the wishes of our agricultural friends in France will be gratified, but the state of agriculture amongst ourselves may be greatly improved.

Papers on this subject, addressed to dr. Samuel Powel Griffiths,<sup>12</sup> Philadelphia, the secretary to the secretary to the society, will be safely received and duly attended to.

Philadelphia, Feb. 3, 1789.

QUERIES AND ANSWERS ON THE PRESENT STATE OF HUSBANDRY AND AGRICULTURE IN DELAWARE<sup>13</sup>

Question 1. What is the latitude of the country, the length of the winter, the mean and extreme

served his country as quartermaster general and as commissary general of military stores. See the unidentified obituary notice in "Newspaper Cuttings," p. 151, Historical Society of Pennsylvania, Philadelphia.

<sup>11</sup> This introduction is from *The American Museum; or, Repository of Ancient and Modern Fugitive Pieces, &c., Prose and Poetical*, 5:374-375 (Philadelphia, 1789).

<sup>12</sup> Dr. Samuel Powel Griffiths (1759-1826), a Quaker physician of Philadelphia trained there and abroad, was the founder of the Philadelphia Dispensary to give medical relief to the poor, a member of the Humane Society, the American Philosophical Society, the Pennsylvania Society for Promoting the Abolition of Slavery, and the Vaccine Society, and was also an advocate of reform of the penal code, care of the mentally deranged, and relief for the French refugees from Haiti. Also an editor and a professor, he exemplifies, as does Tilton, the broad interests and public services of medical practitioners of his day. G. Emerson, *Biographical Memoir of Dr. Samuel Powel Griffiths* (Philadelphia, 1827).

<sup>13</sup> The queries are taken from *The American Museum*,

degrees of cold and heat; and, in general, what is its temperature.

A. 1. The *Delaware State* lies between 38° 30' and 39° 47' north latitude, is about 40 miles wide on the sea coast, and extending from cape Henlopen,<sup>14</sup> up the bay of Delaware, about 100 miles in length, terminates in a twelve-mile circle, eight miles above Wilmington: the mean distance across, about 24 miles. The length of the winter is about three months; the rivers generally freeze up before christmas, and the trees begin to bud & blossom before April. The mercury has been known to descend below 0; but in ordinary, the extreme degrees of cold & heat are about 5 in winter; and 96 in summer, by Farenheight scale. The general temperature of the air is moderate, though liable to frequent & sudden changes

Q. 2. What is the nature of the soil? Is the mould or vegetable earth very deep? Upon what kind of stratum does it lie? Is it upon clay, or what other earth? What is nearly the thickness of each layer?

A. 2. The nature of the soil is very fertile. The mould or vegetable earth may every where be made deep. There are few stones, except on the hills of Brandewine, in the upper extremity of the state. In the upper county of New-Castle, the soil consists of a strong clay; in the middle county of Kent, of a sandy loam; & in the lower county of Sussex, of a loamy sand. In digging deep into the earth, it is common to pass through various strata of different thicknesses, such as clay, sand, gravel, fullers earth, mud, shells, &c.

Q. 3. Do the cultivated grounds produce a crop every year without rest, or every two years successively, or every second year only; or is the

5:375-382, and the answers from Tilton's manuscript in the Philadelphia Society for Promoting Agriculture MSS., volume 3. The answers are also printed in *The American Museum* almost in full.

<sup>14</sup> The southern boundary of Delaware is not at the present Cape Henlopen, but from Fenwick's Island on the Atlantic Ocean to a point directly west and midway across the peninsula. Fenwick's Island was formerly known as Cape Henlopen and was so marked on a map which was used to settle the boundary dispute between the Penns and the Calverts. Edward Bennett Mathews, "History of the Boundary Dispute between the Baltimores and Penns Resulting in the Original Mason and Dixon Line," *Report on the Resurvey of the Maryland-Pennsylvania Boundary, Part of the Mason and Dixon Line*, 165-166 (1908).

same ground cultivated many years before it is permitted to rest?

A. 3. There are various methods of cultivation, and no settled standard; but the same ground is never cultivated many years before it is permitted to rest.

Q. 4. Is manure much in use, and of what kind, new or rotten, cattle or fowls dung? Are horned cattle or sheep folded on the ground? When dung is employed, what quantity is used upon an acre, or any square of a determined measure? How long are cattle folded on the same place? How many head of cattle are folded in a place of a determined extent, and at what season is the ground manured?

A. 4. Hitherto we have depended chiefly on the freshness & richness of our soil; but manure is now more necessary & more used than formerly. All good farmers fold their horned cattle & sheep. The quantity of manure is varied according to the judgment of the farmer, and the use to which he intends to put the ground. From 50 to 100 cattle may be folded on  $\frac{1}{2}$  an acre of ground, and it is customary to move their pens every ten days. Cattle are folded during the summer & autumn; stable manure & litter are carted out early in the spring.

Q. 5. Is marle in use? of what colour is it, or is it of two different colours? Which is the predominant one? In what quantity is it employed and what is the benefit of it? How long will it last? Is not the earth or mud dug out of rivers or rivulets, or even sand, according to the nature of the soil, or rotten sea-plants, or salts produced by the burning of those plants, or any other substances, preferable to marle?

A. 5. Marle is not at all in use, nor sea plants; but ashes made by culinary uses, is discovered by some few experiments, to be a most advantageous manure. A less quantity serves than of any other, and is most conveniently distributed in hills, or dropped in small parcels, for any purpose whatsoever. Two table spoonfuls sprinkled on a hill of indian corn, after it has sprouted above the earth, will be sufficient.

Q. 6. How many square fathoms or feet are contained in an acre of land measure? What are the subdivisions of that measure?

A. 6. There are 43560 square feet in an acre. The subdivisions are half acres, perches,<sup>15</sup> feet.

Q. 7. What plants are generally cultivated,

<sup>15</sup> A perch is equivalent to one rod.

first, for man's food, second, for cattle and fowls; third, for the arts? How long has the cultivation of those plants been introduced, and how far does that culture extend itself in the neighbourhood?

A. 7. For man's use, are cultivated wheat, barley, indian corn & buckwheat, besides potatoes, cabbage, various kinds of pulse & other garden truck.<sup>16</sup> These all furnish provender for cattle; besides which, oats and various kinds of grass, more especially *Timothy & Clover*, are cultivated for the use of cattle.

Q. 8. In what order are the different kinds of grain sown? For instance, does wheat precede barley or oats, or does buckwheat or hemp, &c. follow rye?

A. 8. It is most common to sow wheat & rye in fields that have been cleaned of weeds, by the previous culture of indian corn. Many sow among the corn before it is gathered; but the more approved practice is to fallow up the ground,<sup>17</sup> the year following. It is found that wheat will grow very well after barley; and our oats & flax are generally sowed in the spring, on a piece of ground which we mean to fallow for wheat in the fall. We raise little or no hemp in Delaware, although the soil is very capable of it; and buckwheat is only cultivated as a rarity, by a few farmers, and then it is sowed in a bye patch, or in some part of the corn field.

Q. 9. Are there different kinds of rye, wheat, barley, oats, flax, and what are their distinguishing marks? To which of these grains is the preference given, and which is the most productive?

A. 9. There are varieties in wheat, barley, oats, & flax, but I am not acquainted with any in our rye. The differed kinds of wheat are distinguished various ways; sometimes by the chaff, according to the colour, either red or white; sometimes by the ear,<sup>18</sup> as it is either bearded or otherwise; and in selling, by the grain, the millers preferring the white grain to the red, and all smooth wheat to the bearded. Many farmers, however, cultivate the bearded wheat, from an opinion that it is the

<sup>16</sup> Pulse crops are legume food crops such as dry beans and peas.

<sup>17</sup> Fallow ground usually is ground that is cultivated for the season without seeding. The purpose of the practice is to conserve moisture and to destroy weed seed. Fallow ground sometimes is referred to as ground that is left uncultivated and unseeded for a season.

<sup>18</sup> Ear, meaning head of wheat.

<sup>19</sup> So  
<sup>20</sup> As  
of the s

hardest, and will stand the winter best, especially in low grounds. Spring & fall barley are distinctions that explain themselves. The only variety in our flax is that of long line, supposed to grow higher than any other.

Q. 10. What seed is generally used for sowing; is it of the growth of the country or procured from abroad? If the last, from whence is it procured, in how many years is it necessary to renew it?

A. 10. All the seed used for sowing is of the growth of the country. The farmers sometimes swap with design to get clean seed or of another kind; but have no occasion to send out of the state, to renew their seed.

Q. 11. If, for instance, the culture is begun by wheat, how often is the ground ploughed? or, if it is cultivated by hand, what tools are made use of; the spade, the mattock, the pitchfork, or the hoe, or any other? how deep, and at what seasons is the ground tilled?

A. 11. In a field cleaned of grass, by the culture of indian corn, the preceding year, the prevailing practice is to plough it once after harvest, and then harrow in the seed. But if the culture for wheat is begun upon a grassy sord,<sup>19</sup> the field must be flushed in the winter,<sup>20</sup> or early in the spring, and the ground ploughed again in the summer, before the grain is harrowed or ploughed in. The plough is the only instrument used for breaking up our farm lands. The spade is only used in gardens, and the mattock occasionally about stumps, where the plough does not succeed. Our wheat fields are generally tilled from 4 to 6 inches deep, and it is a growing opinion that the deeper the better.

Q. 12. Are the furrows flat or high? or in other words, what sort of ploughs and harrows are made use of? are the furrows made by a single ploughing, or does the plough pass repeatedly along the same furrow? what is their height?

A. 12. The small single plough is the only kind in use among us. This, however, admits of some modification, according as the soil is stiffer or lighter. In a grassy field the sord is turned over flat; but in a fallow previously prepared by the culture of indian corn, it is easy to make the broken ground stand up on edge, which is esteemed the best fallow. Rake & fluke harrows are used for different purposes; the former for pulverizing and leveling the fallow fields, and harrowing in the seed;

the latter for weeding between the rows of corn.

Q. 13. What is the season for sowing wheat or any other grain? is any preparation used to the seed previous to its being sown? if so, what is the preparation, why is it used, and what are its effects?

A. 13. The best season for sowing wheat, barley & rye, is during the month of September. Oats & flax should be sowed the latter end of March & beginning of April. Indian corn is planted from the beginning to the end of May. We have hitherto used no preparation of the seed previous to sowing.

Q. 14. Are the seeds covered by the plough, the harrow, or the rake; or how?

A. 14. Wheat, barley, oats & rye may be covered with the plough or harrow indifferently; ploughing is esteemed best, harrowing the most expeditious & convenient method, and consequently most practised. Flax is always harrowed in, and indian corn planted with the hoe.

Q. 15. How much wheat, barley, hemp-seed, rape-seed, &c. is generally sown upon an acre? is it sown by hand, or with any machine? when the seeds are small, as rape-seed, is it usual to mix them with sand or ashes to facilitate the sowing?

A. 15. From half a bushel to a bushel of wheat, and from a bushel to a bushel & a half of barley is sowed to the acre. From 6 to 10 pounds of clover seed, and about 2 pounds of Timothy seed are required to the acre.<sup>21</sup> All these are usually sowed broad cast; and it is usual to mix ashes or fine dust with the small seeds, to facilitate the sowing.

Q. 16. From the time the seed is put into the ground, till it is ripe, does it require any more care? is it necessary to roll it, to hoe, or to weed it; and how is that operation performed, and with what instruments?

A. 16. Our winter crops of wheat, barley, &c. also the oats flax & buckwheat are so disposed of as to require no further care after the seeds are put into the ground. But indian corn requires a laborious & constant tillage from the time of planting until the crop is nearly made. The instruments employed are ploughs, harrows & hoes.

Q. 17. To what height do wheat, rye, Indian corn, tobacco, &c. grow?

A. 17. Wheat & rye grow from 3 to 6 feet,

<sup>19</sup> Sord is a grass sod.

<sup>20</sup> As used here flushed apparently means cultivation of the soil.

<sup>21</sup> The current rates of seedings per acre are: Wheat, 1½ to 1¾ bushels; barley, 1½ to 2 bushels; red clover, about 8 pounds; and timothy, about 6 pounds.

barley & oats from 2 to 4 feet, and indian corn from 7 to 14 feet high. Tobacco when permitted to seed will grow to the height of 6 feet; but when topped & cultivated for use, rarely exceeds 3 feet.<sup>22</sup>

Q. 18. At what seasons do those plants blossom and ripen? what precautions are necessary in gathering, carrying home, drying, securing and preserving them?

A. 18. Barley, rye, wheat, oats & flax all blossom and ripen, in the order here mentioned, during the month of June; and are gathered in, from the middle of June to the middle of July. As they are cut or pulled in the field, they are bound up in sheaves & put into small shocks of about 12 sheaves each; after drying in this manner some days, they are carted together and stacked out of doors. Flax & oats require housing more than the rest.

Q. 19. What circumstances are most favourable to the productions of the country? what are the most hurtful, either from the air, the rivers, animals, or destructive insects? what are the means used to guard against these inconveniencies?

A. 19. Our winter crops are most favoured by uniform cold weather, and snow sufficient to cover the ground. The summer crops are most favoured by an uniformity of warm weather, with frequent showers, rather than large gluts of rain. Frequent alternate thawing or freezing in winter, which our climate is too liable to, spews out the growing crop in such a manner, as in the spring to leave it but thinly set upon the ground. I have known a cool spell of weather in August to stint the crops of corn very much. But draughts most frequently injure our summer crops. Worms sometimes do injury; but a destructive insect, called the *fly*, has of late years done us more damage, in our crops, than all other contingencies whatsoever.<sup>23</sup> An ingenious friend of mine has made experiments which prove satisfactorily that no grain of wheat is ever injured by the fly, but such as have the embryo of the insect deposited in it while young & tender, in like manner as the insect is deposited in the

garden pea. And upon this principle it is that our most effectual precautions are taken against these destructive creatures. Some thresh out their grain immediately after harvest, and sell or manufacture it before the insects have time to make any advance in their growth. Others thresh out their whole crop & let the grain & chaff lie in bulk together, by which means the air is effectually excluded & the insect smothered. And those who have incautiously cleaned their wheat, when infected with the fly, find by experience, it is best to let it lie in bulk undisturbed, whereby the surface soon becomes mouldered into a mealy clammy incrustation, by which the air is excluded, and all within is preserved unhurt. The Idea of kilns have occurred to some, but have not been practised for this purpose. The hard winter of 79/80 so effectually destroyed these insects, that I have heard but little complaint of them since.

Q. 20. Are there any plants that are noxious to the useful ones and to the seed in the ground? what are their common as well as botanical names? how are they destroyed or prevented from having any effect?

A. 20. We have cockle & cheat that may be avoided by good farming; but the most noxious and injurious plant is wild garlick or *Allium*. When this gets possession of ground, no effectual method has hitherto been discovered for rooting it out; it seeds about the same time with the wheat, and it is with great difficulty separated from the clean grain; manufactured with the wheat, it gives the flour a disagreeable taste of garlick, and injures the sale of such wheat & other grain as abound with it. This plant is most injurious in poor land; and the best guard to be taken against it is to force the land with manure, by which means the grain rises thick & high above it, and stiffling the garlick, prevents it from seeding. It is also found by experience, that sowing oats in the spring, or fallowing the ground without sowing it, has a like tendency to prevent the garlick from seeding.

Q. 21. Are the different kinds of grain subject to any diseases? how are these diseases indicated, and what means are used to preserve the grain from them?

A. 21. Our winter grains are frequently liable to a disease called the rust, occasioned by thick fogs, a little before harvest. It is not every fog that rusts the grain; but they are sometimes endowed with so corrosive a quality, as in a few hours time, to strike all our wheat with the rust.

<sup>22</sup> These data probably represented extreme heights of the different crops. The usual current heights are: Wheat and rye, 3 to 3½ feet, barley and oats, 2 to 2½ feet, and Indian corn, 7 to 10 feet. Tobacco currently is seldom grown in the State.

<sup>23</sup> The coming of the Hessian fly to Delaware is described in a letter of Charles Wharton to Richard Peters, June 12, 1792, in the Philadelphia Society for Promoting Agriculture MSS., 3:27.



In this disease the exterior cuticle of the straw is corroded or destroyed<sup>24</sup> in such a manner as to let the juices or nourishment destined for the ear, weep out & dry upon the straw, in form of rust; by which means the grain is impoverished & diminished; and the wheat is injured in its quantity, its weight & sale.

Another disease to which our grains are liable, is called the scab. Wheat is more especially apt to be scabbed. In this kind of blast, although the ears look fair, and the *calices* or chaff are very complete, yet the grain will be wanting, sometimes in one half, but more frequently in spots on different parts of the ear. According to the sexual system of Linnaeus, the flowers of vegetables have male & female parts, and the farina or pollen of the male, analagous to the semen of animals, is necessary to the impregnation of the female, for the production of fruit. Hard and continued rains happening, at the time when the wheat is in blossom, wash off & destroy the pollen of the males, in such a manner as to deprive the females of its fructifying influence. The consequence is, that in every flower thus injured, although the calix or chaff may grow complete, there will be no vestige of grain, at the ripening of the ear. As June is not our rainy season, the long continued rains necessary to produce this disorder in our wheat, happen by a rare contingency only; the rust much more frequently. As to the *black blast*, by which the ear of wheat & other grains are mouldered into a black smut, we have solitary examples of it in all our fields, but never to be regarded as of any consequence.

Q. 22. What is the common length of the ears of wheat, rye, barley, &c. the thickness of the stalk at the foot, and how many grains in one ear?

A. 22. The common length of the ears of wheat & barley is from 3 to 5 inches; of rye from 4 to 6 inches. The thickness of the stalks at the foot is from  $\frac{1}{4}$  to  $\frac{1}{2}$  of an inch. From 30 to 80 grains may be contained in an ear. The ears of the barley and rye, however, generally contain more grains than those of wheat.

Q. 23. Are artificial meadows in use? with what plants are they cropped? at what season and how often do they mow them?

A. 23. Artificial meadows abound in the two upper counties. They are cropped chiefly with

Timothy grass & red clover. The clover is cut the first time early in June, and twice or three times afterwards. Spear grass of every kind is cut but once, and that soon after harvest.

Q. 24. Where are the crops put; is it in barns or under sheds, or do they stack them without doors? How are those stacks made and secured against injuries of the weather? Can grain and hay be well preserved in stacks? Is the grain threshed on the field, or in the barns? Is it threshed immediately after harvest, or in the course of the year?

A. 24. Our crops of hay are all stacked out of doors except clover, which requires housing. These stacks are commonly made round or square, and carried up in a bulbous form to a point at top. Sometimes, however, long ricks are made, by those who have large crops. Grain is preserved in the same manner; oats, however, is more apt to spoil in stacks, and therefore more commonly housed than other grains.

Q. 25. How is the grain threshed; is it with a flail or with sticks, or on a barrel, or by the trampling of animals? how is the flail or any other instrument for threshing made? What are the reasons for threshing immediately after harvest, or deferring that operation till a later period?

A. 25. Wheat, our principal crop, is generally trod out with horses, immediately after harvest. We tread out barley also, but not generally so soon as wheat. Our smaller crops, such as rye, oats, buckwheat &c. are generally threshed out, when not used for cattle in the straw. The flail is the only instrument used for threshing. This is made of two smooth tough pieces of wood, the shortest called the swingel, the longest the handle of the flail, which are connected together by a swivel made of iron, wood or the hides of animals: the two latter are esteemed the best, as it is not convenient, in striking with the flail, to have the weight preponderate at the swivel. The occasions of our farmers induce most of them to tread out their wheat & barley presently after harvest; the millers also encourage the sale at this time; and sometimes the fly renders this measure indispensable. Wealthy men, however, often keep their grain in stack or in the granary, for the best market.

Q. 26. What is the common produce of a certain extent of ground in green or dry forage, in corn, grain, seeds, or any other production? What is the proportion of increase?

A. 26. An acre of ground will produce of Timothy from one to two tons of dry forage—of

<sup>24</sup> At this point there is a marginal note "out" which seems to apply to the rest of this paragraph and the first three sentences of the next.

red clover from 2 to 3 tons—of indian corn, from 15 to 50 bushels—of wheat from 6 to 20 Bushels—of barley & rye, from 10 to 35 bushels—of oats & buckwheat, from 15 to 30 bushels—of irish potatoes, from 100 to 300 bushels.<sup>25</sup>

Q. 27. How many horses or oxen are used to a plough? How tall are those animals? How much ground do they till in one day, when the days are of a moderate length; and allowing the field to be ploughed at the distance of two miles from the farm house?

A. 27. Two or three horses are used to a plough, & 4 or 6 oxen. Oxen are from 12 to 14 hands high generally; we have but few cattle of the large breed. Our horses are from 13 to 16 hands high. A hand or hand's breadth, is estimated at 4 inches. A single plough will turn from an acre to two acres of fallow in a day;—But we have no such thing as a field two miles distant from the farm house.

Q. 28. Allowing the fields to be at the distance of two miles from the farm-house, how much ground can two oxen or horses harrow or roll in one day? How many cart loads of dung can they carry to the field, and what number of sheaves can they bring home?

A. 28. —

Q. 29. What quantity of ground can a man sow or till in one day with the spade, the mattock, or the hoe? How much wheat is he able to cut with a sickle; and how much of any other plants can he mow?

A. 29. We only till our gardens with the spade; and hoe our corn only after the plough & harrow. A man can cut an acre of wheat with a sickle in a day; cradle four times as much oats or barley; and mow an acre of green grass with a naked scythe.

Q. 30. Are the farm rents paid in specie or in produce? Are the lands let out in halves? Do the cattle belong to the landlord or to the farmer, or is their increase divided between them?

A. 30. The farm rents used to be paid in money altogether. Since the revolution, the depreciation & fluctuation of our money has given occasion to our rents being often paid in produce, and the letting of lands sometimes, though rarely on shares. The stock of cattle generally belongs to the tenant; and when rented of the landlord, it is for a pecu-

niary consideration, the increase being never divided.

Q. 31. What are the corn measures, their subdivisions, and their names and the weight of each?

A. 31. For measuring indian corn in the ear, we have a measure called a *barrel* containing five bushels. By this it is customary to estimate the whole amount of the crop of corn, and to divide the shares between the landlord & his tenant or cropper. For measuring shelled corn & grain of every kind, our measure is the bushel, the subdivisions of which are the half bushel & peck.—The weight of a bushel of wheat is 60 pounds, varying a few pounds, over or under, according to the goodness of the wheat.

Q. 32. Are the seeds and plants gathered in Delaware of a good quality? Wherein do they differ from those of the neighbouring states? are they of a higher price and better sale?

A. 32. The Wheat of the peninsula between Delaware & Chesapeake, possesses a soft fine quality, favourable to the manufacture of superfine flour. It is said the hard flinty wheat from the high lands of Pennsylvania & New-York, can hardly be manufactured into superfine, without a mixture of our wheat. This circumstance sometimes enhances its price.

Q. 33. Is any preparation made use of for grain, seed, or plants, after they are gathered, to fit them for the use of men or cattle, or to be employed in the arts?

A. 33. Grain & seeds are always ground or boiled for the use of men, and sometimes for the use of cattle also.—Straw is sometimes cut fine for cattle; hay and & other fodder require no preparation after they are gathered in.

Q. 34. Does the grain, when ground, yield much meal? and what quantity for a determined measure? Is the old or the economical mode of grinding in use?

A. 34. Three bushels of wheat yield a hundred weight of fine flour, besides shipstuff, shorts & bran. In Delaware, the manufacture of flour is supposed to be in the utmost perfection; and is much more than the produce of the state. Besides an abundance of mill-seats improved all over the state, there are, in one view on the brandewine, ten mills, with not less than 20 pair of stones, capable of grinding 2000 bushels per diem. These mills are generally constructed in such a manner, that one set of gears serves two pair of stones, not for both pair to run at once, but when one pair is

<sup>25</sup> The 1934-43 average Delaware yields of the crops referred to are: Clover and timothy hay, 1.2 tons; Indian corn, 28.5 bushels; wheat, 18.8 bushels; barley, 30.3 bushels; rye, 13.0 bushels; oats, 29.0 bushels; and Irish potatoes, 88 bushels.

up dressing or cooling the other to run; and thus in active or busy times the mill grinds perpetually day & night. It is surprising to tell how little manual labour is required in these mills, the whole business being performed by means of machines, except the oversight of one man to each mill. Wheat & other grains are taken from the shallops or waggons, & put into the garner; from thence the grain is run through screws, and poured into the grinding hopper; after passing the stones, the flour is carried immediately from the trough, aloft to the cooling floor; there it is spread about to cool; and there collected together in the boulding hopper; from whence the flour passes through the boulding cloth and is separated from the bran, shorts &c.—and all this is performed by machines, that move by the force of the same water which turns the mill. Oliver Evans,<sup>26</sup> an ingenious countryman has lately invented sundry of these machines, among which is one for separating effectually the wild garlick from the wheat.—As a reward for his ingenuity, he has obtained, by an act of the legislature, an exclusive right & privilege of making & vending the same.—It is a prevailing opinion in Delaware, that we have the largest & most perfect manufacture of flour, within a like space of ground, known in the world; and that this observation applies equally to the state at large, as to the particular district on the Brandewine.

Q. 35. Are the flax, hemp, pulse, &c. better than in other countries?

A. 35. Our flax is of a luxurient growth and superior quality.

Q. 36. In a district of a given extent, how many acres are supposed to be cultivated in wheat, rye, hemp, madder, or coleseed?

A. 36. We have no established mode of farming, or order in the arrangement of our crops. The most approved method is to lay out the farm into six fields; to sow one field in wheat, one in barley, and plant one in indian corn, every year: or two in wheat & one in corn.—The smaller crops, such as oats, rye, buckwheat &c. are generally made in bye patches or some part of the wheat field.

<sup>26</sup> Oliver Evans (1755–1819) was born in or near Newport, Delaware. He invented various labor-saving milling devices which were patented to him in Pennsylvania, Maryland, and Delaware, and by the Federal Government and was "the outstanding steam-engine builder of his time." Greville and Dorothy Bathe, *Oliver Evans*, 4 (Philadelphia, 1935); Evarts Boutell Greene, *The Revolutionary Generation, 1763–1790*, 65 (New York, 1943).

Q. 37. Does the country produce more or less grain than is necessary for its own consumption? If less, whence is the deficiency supplied? if more, how is it disposed of?

A. 37. Delaware produces many times over more grain than its own consumption. A great deal of our flour, indian meal & corn is exported from the port of Wilmington to the West Indies, and even to Europe; but much more from Philadelphia. Sometimes, though rarely, small trading vessels go from Delaware to New York, New England, and the southern states.

Q. 38. Are there any manufactures that employ plants, used in arts, which grow in that country?

A. 38. Flax is spun in almost every private family; but there are no manufactures upon the large scale, in which this or any other plants are used.—Except flax, I recollect none other plants used in the arts, which are cultivated in this state.

Q. 39. Does the country abound with wood, or is it covered with heath or fern? Which are the most common trees in the woods? Are the forest trees of a fine growth?

A. 39. This state abounds with wood the most lofty & fine. We have no such thing as barren hills or plains. The most common trees are oaks, hicory, poplar, walnut, maple, ash &c. In the lower and more sandy parts of Sussex county, there are immense cedar swamps of great value. In this district also the pines on the high ground grow very lofty, and are admirably fitted, both in size & quality, to saw into plank & scantling.

Q. 40. Are there breeds of cattle, and of what kinds? Are there pastures to feed, and grass to fatten them? Are the cattle stall-fed, and with what food? How do they feed them the whole year round?

A. 40. Some few farmers have the large english breed of cattle; but the most prevailing are of the smaller kind. These are bred in the greatest number on the marshes & forests of the two lower counties; from whence they are driven in large droves to the county of New Castle, where the most cultivated meadows abound, and they are grazed & stall-fed for the markets of Wilmington & Philadelphia.<sup>27</sup> Fattening cattle, during the warm weather, run at large in grazing grounds, changing them occasionally, from field to field; in

<sup>27</sup> See letter of Major Philip Reybold, grazier, to Richard Peters, May 22, 1810, in Philadelphia Society for Promoting Agriculture, *Memoirs*, 2:236–237 (1811).

the winter, such as are stall-fed are put each into a separate stall and fed with the most luxuriant hay. There is a prevailing opinion, that beef is firmer and in all respects better, when fattened upon grass than upon grain.<sup>28</sup>

Q. 41. Do they breed horses and mules? We wish the persons to whom these queries may be presented, to give some details relative to the studs, the stallions, the decrease of horses and mules; and the reasons of such decrease.

A. 41. Very few mules have ever been bred in Delaware. We breed horses for the road & other services; but are not so ambitious of race horses; as the people of Virginia & North Carolina. Our laws discourage racing. I am far from thinking that either horses or mules decrease or degenerate in size or otherwise, by breeding them in this country.

Q. 42. We wish them also to be so kind as to give some details relative to the height and weight of the sheep; to the quality, price and weight of their wool, either washed or not; and to the mode of managing and nourishing them the whole year.

A. 42. We have different kinds of sheep, some imported, but chiefly of the small breed, about 2½ feet high, and weighing, when dressed by the butcher, about 20 pounds pr. Quarter. The quality of their wool is esteemed good and sells at 2/ pr. pound. The weight of a fleece is from 3 to 9 pounds. Sheep are most easily & cheaply provided for of any cattle. The shortest pastures serve them in summer and they refuse fodder in winter. Some cut salt grass from the marshes and stack it upon poles laid horizontally, about 4 feet from the ground: in winter the sheep go under this shelter and eat the hay from between the poles. This is found to be more salutary for sheep, than housing them in a more confined manner. There is great variety in mutton as an article of food; that raised in Delaware, is of the best quality.

Q. 43. At what age do they sell their sheep or horned cattle, horses, or mules, for whatever use they may be intended? What is the common price of those animals in good condition?

A. 43. Excepting lambs & calves, neither sheep nor horned cattle are customarily sold, under 4 years old. They are not sooner mature or fit to be killed. Horses & mules are sold at any age;

<sup>28</sup> If Delaware consumers preferred grass-fed beef it apparently was due to their lack of familiarity with grain-fattened beef. Grain-finished beef brings a marked premium on the market over grass-fed beef.

they are generally broke at 3 years old, and at 4 are esteemed fit for any use. The common price of sheep is from a dollar to 15/—Horses, from £15—to £40—and other cattle from 3 to 10£.

Q. 44. What is the ordinary food for men the whole year round? How do they prepare it? Are the inhabitants vigorous or weak, active or slow?

A. 44. The inhabitants of Delaware use a great proportion of animal food. Few men breakfast without a portion of meat; and it is an universal practice to dine in the middle of the day, upon a full meal of meat, with bread & vegetables. The meanest slaves have this indulgence. Supper is usually our lightest meal. There is also an excessive use of tea & coffee in this state. Every housekeeper that can afford it, breakfasts upon one or the other; and the genteel people generally indulge in the parade of tea, in the afternoon.<sup>29</sup> Butter is much used, especially at breakfast; cheese but little. Salted pork & bacon are the meats most used in winter & spring; fresh killed mutton & other cattle, with poultry, fish &c. in the summer & fall of the year. Salted meats of every kind are boiled. Fresh meats are oftener roasted than boiled. Soups are not much in use. We abound in vegetables of various kinds, adapted as sauces to the various preparations of our meats. The more wealthy inhabitants make their bread of wheat flour; the poorer sort generally of indian meal. The inhabitants of this state are generally tall, muscular, active and remarkably enterprising.

<sup>29</sup> Tilton opposed the use of any food or drink brought from abroad. "During the revolution," he wrote, "independence of government or self government, as it was emphatically styled, was the rage, from Georgia to Maine. At present, an equal zeal appears for independence in our clothing. And, yet, strange to tell, few or none of us think of eating and drinking independently. . . . Whatever apology the inhabitants of cities and towns may have, for their obstinate adherence to tea, coffee, &c. surely farmers have none. Their farms furnish much better food, and at a cheaper rate. How then are we to estimate the folly of crossing the ocean at an expense and hazard incalculable, for the sole purpose of indulging in articles universally admitted to be injurious to health and destructive of property? A Chinese would give ten breakfasts of tea for one of milk. An American farmer purchases tea, at great expense, when he might have plenty of milk and other good things for nothing." James Tilton, "Observations on the Propriety of a Farmer Living on the Produce of His Own Land," Philadelphia Society for Promoting Agriculture, *Memoirs*, 3:142-150 (1814).



The Delaware regiment was notoriously one of the finest & most efficient in the continental army.<sup>30</sup> Although it may be said that many of the privates

<sup>30</sup> The story of the gallant Delaware regiment is told by Christopher L. Ward in his *The Delaware Continentals, 1776-1783* (Wilmington, 1941).

were foreigners, the officers, with very few exceptions, and those not the shortest men, were natives born: and I am persuaded that there was not a corps of officers belonging to any regiment in our army, that surpassed those of the Delaware regiment, for bodily strength & activity.

## RECORDS IN THE NATIONAL ARCHIVES RELATING TO THE RANGE CATTLE INDUSTRY, 1865-1895

HERMAN KAHN

*The National Archives*

Although the entire economic basis for the huge increase in the number of range cattle and the low price for which range cattle beef could be sold in the period 1865-1900 was the free grass of the Federal public domain, there were comparatively few ways in which the Federal Government attempted to regulate or control the industry in this period. The result is that the records of the Federal Government pertaining to this subject are comparatively meager, and some of the most important of them have disappeared. This report is an attempt to indicate the bodies of records in the National Archives in which there is any significant quantity of information bearing on this subject and the general content of these records.

*Records of the Department of State. Correspondence of the Secretary of State Pertaining to the Territories, 1865-1873.* Prior to 1873 administrative jurisdiction over the Territories was in the State Department, and general correspondence concerning political and economic conditions and the economic development of the Territories is to be found in the correspondence of the Secretary of State, in the series generally known as the "Territorial Papers." No complete understanding of the political and economic background and origins of the range cattle industry can be had without a study of the Territorial Papers of the State Department for the pertinent Territories in this period. As usual, the incoming correspondence, i.e., letters received by the Secretary of State from both government officials and private citizens in the Territories, is a more fruitful source than the letters sent. The incoming letters have

been flattened and bound into volumes, and so they can be used and filmed with comparative ease.

*Records of the Department of State. Diplomatic and Consular Correspondence—Mexico.* One problem that arose constantly in this period was the smuggling of cattle across the international boundary between the United States and Mexico. This was done to avoid both customs and quarantine regulations and was a factor of considerable importance in the cattle industry. There is a very large body of correspondence on this subject, some of which has been published in the *Foreign Affairs* series.

*Records of the Department of State. Diplomatic and Consular Correspondence—Great Britain.* The economic importance of the export trade in beef to the range cattle industry in this period, particularly to Great Britain, is well known. There is a considerable amount of material in both the "Diplomatic" and "Miscellaneous" correspondence series which bears on this subject.

*Records of the Department of State. Applications and Recommendations for Office—Territorial Governors.* Insofar as the cattle interests had become an influence in the Territories in the period prior to 1873 the personnel papers of Territorial governors may contain material of interest on the political activities of cattlemen.

*Records of the Office of the Secretary of the Interior. Patents and Miscellaneous Division. Correspondence Concerning the Territories, c. 1870-1895.* In 1873 administrative supervision of the Territories was transferred from the Secretary of State to the Secretary of the Interior.

All reports and correspondence concerning general political, economic, and social conditions in the Territories were channeled into the Patents and Miscellaneous Division of the Office of the Secretary of the Interior. In a sense, this series constitutes a continuation of the correspondence of the Secretary of State concerning the Territories and has the same general historical value as that series. The letters and reports of the governors of the Territories as well as those of other officials and private citizens contain a great deal of comment and information bearing directly or indirectly on conditions which arose out of or affected the development of the range cattle industry. As one of the economic mainstays of the Rocky Mountain Territories in this period, the cattle industry was the subject of general concern to all public officials and prominent citizens, and this interest is reflected in the correspondence of the Secretary of the Interior with such persons. Another very valuable group of records in this series are the so-called "Executive Proceedings," which consist of copies of all documents recording official actions taken by the governors as well as copies of their official correspondence. As such, the Executive Proceedings contain many documents of interest to historians of the cattle industry, especially proclamations concerning quarantines.

*Records of the Office of the Secretary of the Interior. Appointments Division. Correspondence Concerning Appointment of Territorial Governors.* The appointment of the Territorial governors was usually made through the Secretary of the Interior after 1873, and the files contain a great many applications and endorsements for these positions as well as charges and complaints against them. Inasmuch as the most prominent political figures in the Territories were usually closely connected with the cattle industry or received their political backing from various elements in the cattle industry, the personnel papers of these men contain much collateral information on the political interests and activities of the most prominent figures in the industry. These papers, therefore, contain much information on the political orientation of the cattle interests in each of the Territories.

*Office of the Secretary of the Interior. Lands and Railroads Division, Letters Received and Sent.* The basis of the entire range cattle industry was the privilege of free grazing on the public domain, and the public domain was administered by the

Department of the Interior. With the increase in the number of cattle on the public domain, the problem of overgrazing had become acute by the early 1880s. As a result, it became a common practice for cattlemen to attempt to enclose or fence off large portions of public land. This practice resulted in the passage of the act of 1884 which made the erection of fences on the public domain illegal. The enforcement of this act was a responsibility of the Secretary of the Interior. The correspondence files of the Lands and Railroads Division of the Office of the Secretary contain a large number of complaints against the erection of fences on the public domain which are of interest in showing the background for the passage of the act of 1884. The files also contain a considerable amount of correspondence between the Secretary of the Interior and the congressional sponsors of this legislation. After the passage of the act, complaints against illegal fencing of the public domain continued to be numerous. The efforts of the Secretary of the Interior to investigate alleged violations of the law and to prosecute violators are reflected in the large amount of correspondence and reports by special investigators which are to be found in the files of this division.

*Records of the General Land Office. "Miscellaneous Letters" Received.* The "miscellaneous" correspondence files of the General Land Office contain a very large amount of material on illegal fencing of the public domain by cattlemen and investigations of such offenses by special investigators of the General Land Office. This material does not differ substantially in character from that described in the preceding paragraph. The General Land Office was the agency concerned in the first instance, though its reports on such matters frequently were transmitted on up to the Lands and Railroads Division of the Secretary's Office for action there.

*Records of the General Land Office. Abstracts of Land Entries.* Registers of district land offices were required to make monthly reports listing by type of entry each piece of land sold or "filed on" in their districts. These monthly abstracts of entries furnish a convenient method of tracing month by month, the occupation of the public domain by settlers and are hence to some extent an index of the rate of diminution of unoccupied grazing land available to cattlemen.

*Records of the Office of the Secretary of*

*the Treasury. Customs Cases.* The Treasury Department had immediate responsibility for the enforcement of the customs and quarantine legislation affecting cattle. There is in the records of the customs service a large quantity of correspondence concerning cases of cattle illegally driven across the Mexican boundary. In 1881 there was established in the Treasury Department a Commissioner of Cattle who appears to have had general jurisdiction over cattle quarantine matters and who took a general interest in the development of the cattle industry. There was at one time a large quantity of correspondence of this official among the records of the Treasury Department. These records were apparently transferred to the Commissioner of Agriculture in 1885, but inquiry in that Department has failed to uncover the records. They are not in the National Archives. However, a general idea of the functions and work of this office can be obtained from an examination of the correspondence registers of the customs service of the Treasury Department in which the correspondence of the Cattle Commissioner was briefed.

*Records of the Office of the Secretary of the Treasury. Personnel Files.* The existence of cattle smuggling on a large scale led the collectors of customs to ask for additional customs inspectors to suppress this illegal traffic. In connection with such a request in 1879, the collector of customs at El Paso submitted a report showing the locality in which smuggling was most frequent, the routes used by the smugglers, and the termini of these routes. This report is of considerable interest.

*Records of the Office of Indian Affairs. Letters Received and Sent.* Beginning in the late 1870s cattlemen very frequently found it necessary to obtain permission to drive cattle across Indian lands in the Indian Territory. Most of these cattle were destined for the grazing lands of Wyoming and Montana or for one of the railroad towns in Kansas which served as cattle shipping points. In any case, with increasing competition for new grazing land there was strong pressure by cattlemen for permission to graze their herds on Indian lands and reservations. The records of the Office of Indian Affairs contain a very considerable amount of correspondence on this subject, especially in connection with those cases where cattlemen illegally entered their cattle on Indian lands. "Special Cases" 6 to 9 in the correspond-

ence files of the Office of Indian Affairs for the period following 1881 are devoted to the more important trespass cases of this kind.

*Records of the Department of Justice. Correspondence of the Attorney General.* In the late 1880s and through the 1890s most of the Western States, but especially Wyoming, experienced violent disturbances usually known as cattle wars. There were outbreaks of violence between cattlemen as well as between smaller ranchers and representatives of the great land and cattle companies. The most famous of these outbreaks was the Johnson County War which occurred in Wyoming in 1892. Inasmuch as a United States marshal and his deputies were involved in this incident, there is a large dossier on it in the files of the Attorney General. This file is rich in social and economic data that cast light on the origins of the friction between various groups in the cattle industry. The correspondence of the Attorney General also contains much material on the frequent trespasses by cattlemen on Indian lands. These incidents sometimes resulted in requests that troops be called out to eject the trespassers.

*Records of the Department of War. Adjutant General's Files—Indian Territory.* There is a very large amount of material in these files concerning the calling out of troops to eject trespassing cattlemen from Indian lands. These records are closely related to those on the same subject in the files of the Office of Indian Affairs and the Justice Department.

*Records of the Department of War. Adjutant General's Office.* There is a large "consolidated file" (No. 29, 763 P. R. D. 1892) consisting of correspondence and reports received by the Office of the Secretary of War, and the Headquarters of the Army concerning the Johnson County War in 1892, and the calling out of United States troops. This is a very valuable file for the study of all phases of the history of that episode.

*Records of the Department of War. Discontinued Commands.* In cases of large-scale thefts, murders, or other outrages committed by cattle rustlers or other outlaws, the commanding officers at local forts or military posts were frequently asked for assistance. The records of army posts throughout the Territories contain many reports about such incidents. Although it would be difficult to find all of them, it is comparatively easy to locate mention of typical incidents of this

kind in the records of almost any of the army posts in the Territories in this period.

*Records of the Bureau of the Census. Population Schedules for 1870 and 1880.* Any study of the range cattle industry must necessarily be concerned with the gradual encroachment of cultivated lands on the area used or needed by the cattlemen for their herds. The population schedules of the census bureau for the pertinent counties in the Territories would show in each locality the proportion of the population which made its living by farming as compared with those engaged in the cattle industry. Although the use of the schedules of the census of 1880 is restricted, it may be possible to obtain permission from the census bureau to use them for this purpose and also to obtain positive prints from the microfilm copies of these schedules which are in the custody of the census bureau. The census schedules could also be used to learn the proportion of men engaged in the cattle industry who were native-born citizens of the United States.

*Records of the Bureau of the Census. Diary or Record Book of Ed C. Hall, Special Agent of the Census Bureau in Utah Territory During the*

*Census of 1880.* This volume contains an extremely detailed account of the survey made by Hall on the production, transportation, and export of cattle, sheep, and hogs from Utah. It gives an illuminating picture of precisely who was engaged in the cattle industry in each area of Utah in 1880 and the extent of the operations of each individual.

*Records of the Interstate Commerce Commission.* As means of shipment of cattle to market was one of the basic factors in the range cattle industry, the records of the Interstate Commerce Commission bearing on the industry are of very considerable importance. The Commission's records in this period contain case files covering a number of subjects relating to the range cattle industry, including records concerning suits by cattle raisers' associations against railroads, railroad terminal charges for delivery of livestock, freight rates on livestock, depot rights of cattle brokers, methods of weighing livestock, improvement of cattle cars, trackage charges by stockyards, and other general material on the shipment of livestock.

## NEWS NOTES AND COMMENTS

### TEXAS HORTICULTURE AND HORTICULTURISTS

Samuel Wood Geiser's *Horticulture and Horticulturists in Early Texas* (Dallas, Texas, University Press, 1945, 108 p.) sketches in broad outlines the development of horticulture in the Lone Star State. The main interest is the subject's scientific rather than economic history.

The work is divided into two parts. The first has chapters on fruit culture in early Texas, 1820-1850; census returns for fruit crops, 1850-1930; indigenous fruits; Texas horticultural societies, 1870-1896; and Texas horticultural journals, 1868-1907. Part 2 provides sketches of 165 horticulturists who originated or introduced new horticultural varieties or published papers on horticultural discoveries and practices in Texas.

Besides contributing data to Texas agricultural history and to the history of science in Texas, the volume provides an example for the history of special crops and agricultural sciences in other States.

### WARD SHEPARD'S FOOD OR FAMINE

The main concern of Ward Shepard's *Food or Famine: The Challenge of Erosion* (New York, Macmillan Co., 1945, 225 p., illus.) is the need of a world-wide revolution in the organization of agriculture to cope with the difficulties of stabilizing the food supply and of provid-

ing the people on the land with economic and social security. A plan for global action against disorganized lands and waters is outlined.

One of the most valuable contributions of the volume is its analysis of the American experiment in the democratic control of modern technology in the field of agriculture. The significance of the soil conservation district as an institutional framework for cooperative social action is well defined. It is considered as "the archetype of the coming economic democracy, being at once the answer to the disorganized drift of *laissez-faire*, and to the lethal coercion of authoritarianism."

The book calls for the continent-wide organization of land-management districts, with trained guidance, to apply scientific management to farms, forests, and grasslands. "It is the irreducible minimum in reorganizing world agriculture to meet world nutritional needs."

### MISSISSIPPI FARMERS, 1850-1860

The work by Herbert Weaver entitled *Mississippi Farmers, 1850-1860* (Nashville, Vanderbilt University Press, 1945, 139 p.), is an exhaustive analysis of the economic and social structure of the agricultural population of Mississippi during the decade preceding the Civil War. Although the main source of data is the unpublished census returns of 1850 and 1860, a consid-



erable list of other primary and secondary materials have been gristed.

The study of the data for counties representative of the geographical regions of the State has resulted in a number of conclusions that are counter to the traditional views. The large farm rather than the plantation was found to be the typical agricultural unit. Landownership was widely distributed among the nonslaveholding farmers, and there was little segregation of farmers and planters within the regions. However, there were many farmers in the rich land regions, and few planters in those with poor soil. The author also concluded that the trend of the agricultural population during the decade was toward greater prosperity. Many nonslaveholders became slaveholders or even planters and many landless farmers became landowners. In other words, the economy of ante-bellum Mississippi was not closed.

This volume is the second book resulting from a group of studies on the plain people of the Old South by students of Frank L. Owsley of Vanderbilt University. The first was *The Tennessee Yeomen, 1840-1860* (Nashville, 1942), by Blanche Henry Clark (now Mrs. Weaver). These studies are significant for the methodology and also for the conclusions which indicate the necessity of rewriting much of the history of the ante-bellum South.

#### SCHMIDT'S RURAL HUNTERDON

Hubert G. Schmidt's *Rural Hunterdon: An Agricultural History* (New Brunswick, N. J., Rutgers University Press, 1945, 331 p., illus.) traces the economic development of Hunterdon County, New Jersey, from the early eighteenth century to the present time. It has chapters on the persistent rurality of the county, the geographical features, the people, landownership, the forests and arable land, the buildings, equipment, and methods of farming, the field and orchard crops, animal husbandry, transportation, communication and trade, industry, and labor. The chapter on "Ways of Life" traces the changes in standards of living in terms of household equipment, lighting, water supply, food, and clothing.

Probably few other rural counties still have as many valuable source materials relating to its past. In consequence the author had an unusual opportunity as well as task. His main reliance was the official records, the local newspapers, the account books of farmers, artisans, and businessmen, and collections of correspondence, diaries, and other personal papers.

The volume has unusual significance for local and agricultural history. The space limitation, the time span, and the proximity of sources permitted the careful delineation of the actual stage-by-stage developments of all economic phases of farming and rural life in the county, and these, in turn, contribute not only actual data but a sharper focus for corresponding phases of the national agricultural scene.

#### THE FARMER'S LAST FRONTIER

Fred A. Shannon's volume, *The Farmer's Last Frontier: Agriculture, 1860-1897* (The Economic History of the United States, v. 5, New York, Farrar & Rinehart, 1945, 434 pages), provides the most comprehensive and scholarly account available of the economic developments relating to the agriculture of the United States during the period covered. As the title suggests, the emphasis is on the completion of agricultural settlement and the effect of this process upon farming in both the new frontier and the older regions and upon the national economy as a whole. The economic welfare of the farmers is also a major concern.

As this period of American agricultural history is rampant with stress and change, the problems of organization and emphasis in studies concerning it are unusually difficult, but the author has resolved them moderately well. The volume begins with a chapter on "Nature and the Farmer" in which attention is given to the extent to which the farmers understood the land on which they worked. The chapter on "Agricultural Settlement in New Areas" adds substantially to the interpretation of the actualities behind the census maps of persons to the square mile. The chapter on "Disposing of the Public Domain" presents the subject in perspective with reference to the latest findings of the specialists on the subject. There are seven chapters on the practical problems of agriculture considered by regions and one on farm mechanization. The chapters on governmental activity in agriculture, the political revolts, and the farmers' attempts at self-help through cooperatives emphasize the inadequacies of the government's efforts on behalf of the farmers against economic monopolies. The chapter on "The Farmer and the Nation" provides succinct delineations of the place of agriculture in the nation's economy and of the city as a safety valve for rural discontent. The concluding chapter is a summary on "The Literature of the Subject" that the author found sufficiently useful to recommend.

The volume is not perfect in all respects, but listing a bill of particulars would tend to overemphasize its shortcomings and detract from its merits. Apparently due to the lack of space, there are a number of regrettable omissions. There are also inaccurate and doubtful statements and some conclusions that are questionable. However, historians who are aware of the intricacies of the subject in the period covered and the inadequacies of the pertinent monographic literature will acclaim the author's bravery, stamina, and skill in essaying this pioneer venture.

#### SHEPHERD'S EMPIRE

*Shepherd's Empire* (Norman, University of Oklahoma Press, 1945, 364 pages), by Charles Wayland Towne and Edward Norris Wentworth, traces the history of the

sheep industry in the trans-Mississippi West from its beginnings to the present century. Hitherto this story has been overshadowed by that of the range cattle industry and has been available only in fragments.

The authors have combined the regional and topical approaches in an eminently satisfactory manner. The first chapter notes the landing of domestic sheep on Hispaniola by Columbus in 1493 and outlines the establishment of sheep raising in Mexico and its spread northward to the Spanish borderlands. The next eight chapters are devoted to sheep at the missions, the golden age of pastoral California and New Mexico, sheep and the "Gold Diggers, Soldiers, and Saints," sheep in Texas, the Indian as foe and friend of sheep husbandry, "The Day of the Great Sheep Trails," "Cattlemen War on Woolies," and "Sheep against the Sea" in California. The remaining chapters are concerned with predators, poison plants and droughts, "Herders and the Herded," lambs and shearing, and leadership in flock improvement.

The volume is based on extensive research in a wide range of sources, including manuscripts, government documents and publications, newspapers, letters and interviews, articles, and books. The diction is vigorous and straight-forward. The maps are useful, and the drawings by Harold D. Bugbee supplement admirably the definitely successful characterization of the herder and his flocks. The use of anecdotes and quotations has also contributed appreciably to this end. *Shepherd's Empire* is a delightful and outstanding work which deserves many readers.

#### GOD MADE THE COUNTRY

The main theme of Edwin Townsend Booth's *God Made the Country* (New York, Alfred A. Knopf, 1946, xxv, 330, xx pages) is the significance of the rural way of life for the classic literature of European civilization and the contribution of rurality to outstanding creators of this literature. Much has been said generally about agriculture as the basis of civilization throughout the ages, but it has remained for this study to sketch the relationship of rural life to the works of men of letters.

The volume consists of a series of essays in literary history and criticism that reinterpret the lives and works of a considerable number of the main figures in literature with reference to the author's main theme. The writers are considered in chronological order, beginning with Hesiod, Xenophon, Horace, and Vergil and concluding with Emerson, Hawthorne, Melville, and Tolstoy. In addition there are essays concerned with Ausonius, Sidonius, Madame de Sevigné, Voltaire, Alexander Pope, Horace Walpole, Thomas Gray, Lord Bolingbroke, James Thomson, Lady Mary Wortley Montagu, William Cooper, the Wordsworths, the Carlyles, Thoreau, and Alcott.

In the pages of this book many of the seemingly austere and vaguely understood figures of our literature courses become human beings when delineated with reference to the rural settings where they did much of their creative writing. Few realize that Voltaire spent more than forty years of his long life in the country. Lady Montagu among her bees, silkworms, and grapevines is a distinct contrast from the traditional portrayal of her as a bluestocking in the drawing rooms of London and the salons of the Continent. The Carlyles at Craigenputtock cease to be gloomy and forbidding. The titanic craftsman of *War and Peace* is revealed as an enthusiastic and genial country gentleman. Perhaps most striking of all the reinterpretations is the portrayal of Melville as he lived within view of beautiful Mount Greylock while he created *Moby Dick*.

As implied in the title, the book includes a philosophical defense of the virtues of rural living. Some readers will contend that certain of the writers here considered sought refuge in country quiet because of economic necessity or otherwise and not primarily because they had experienced all that urban and industrial life had to offer and had sickened of it. However, regardless of what the individual reader's reaction may be to the manner in which this philosophical theme is treated, the book is delightful and stimulating and deserves to be read, re-read, and re-read again.